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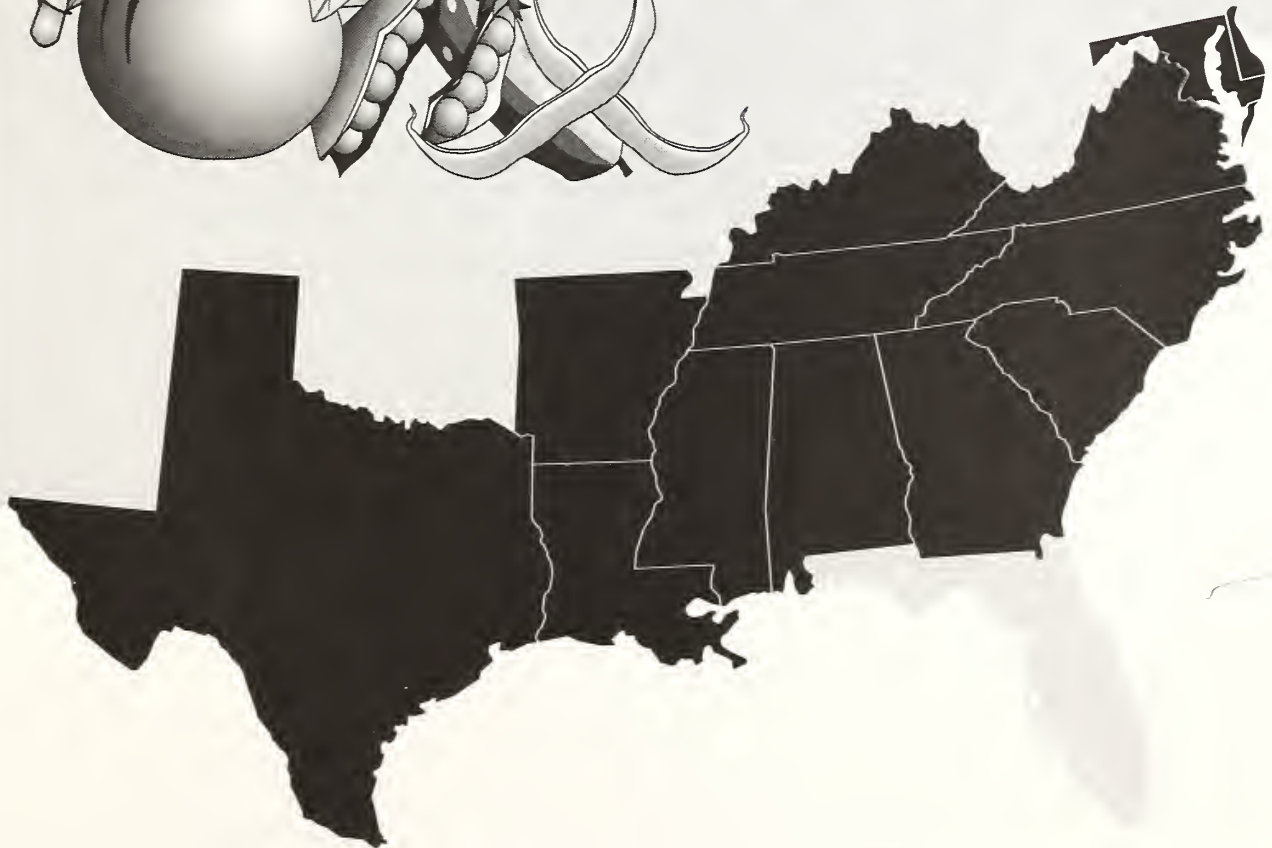
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Report 122

Opportunities for Vegetable Processing Cooperatives in the South and Southeast



Opportunities for Vegetable Processing Cooperatives in the South and Southeast

Edgar L. Lewis

This study investigates the production, marketing, and human resources available in a 13-State study area, that could lead to expanding and developing vegetable processing cooperatives.

The analysis shows that the study area has abundant productive land, ample water for irrigation, growing population, and sufficient production of snap beans, sweet corn, cucumbers, green peas, and tomatoes to support vegetable processing cooperatives. However, all types of farms, including vegetable farms, are decreasing both at the national level and in the study area, but the rate is faster in the study area.

Of the 208 commercial processing plants in the study area, only 2 were cooperatives. The lack of additional processing cooperatives in the study area can be attributed to the competition from existing noncooperative processors. In addition, farmers have less risk with major field crops due to Government support programs.

If traditional processing cooperatives are not feasible, another option available to farmers is a fresh processing operation (pre-cut) that could be developed and operated as a cooperative. This option could provide opportunities for vegetable farmers to cooperate in providing services for themselves and increase their farm income.

Key Words: Processing, Cooperatives, South, Southeast, Alternative Crops, Pre-Cut/Fresh Processing

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Preface

The objective of this study is to investigate the potential for vegetable processing cooperatives in 13 South and Southeast States and to identify factors needed to develop successful vegetable processing cooperatives. States studied were: Alabama, Arkansas, Delaware, Georgia, Kentucky, Louisiana, Maryland, Mississippi, North Carolina, South Carolina, Tennessee, Texas, and Virginia. For analysis purposes and to preserve confidentiality of data, States are grouped into three regions-- South, South Central, and Southeast. These regions are defined based on the proximity of States and common production characteristics.

Compared with fruit, vegetable production is more homogeneous and concentrated in the three regions. Given the small volume and limited varieties of fruit being produced, the major emphasis of this study will be on vegetable production and processing cooperatives. However, since most processors handle both fruits and vegetables, there is no attempt to separate fruit from vegetable production in the discussion of processing plants.

This study focuses on five vegetable crops--snap beans, sweet corn, cucumbers, green peas, and tomatoes. These crops are grown in each of the 13 States for fresh and processed markets.

The number of fruit and vegetable processing firms listed in the study are primarily those included in the United States Census Bureau Standard Industrial Classification (SIC) and limited to codes 2033, 2034, 2035, and 2037. Firms of this type purchase raw products directly from farmers, wholesalers, and brokers for processing.

In addition to secondary data used in the study, on-site visits were made to the two vegetable cooperatives and several noncooperative fruit and vegetable processing plants for more information. Data presented on fruit and vegetable acreage, volume, and value were reported by USDA's National Agricultural Statistics Service (NASS). Beginning in 1982, NASS reduced the number of processed vegetable crops being reported from nine to five--asparagus, broccoli, carrots, and cauliflower were eliminated. Also, data for states reporting a small number of units (acres and tons) for individual crops, were reported in aggregate to preserve confidentiality.

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Highlights

The 13 South and Southeast States in the study area have abundant productive land and ample water for irrigation to support commercial fruit and vegetable production. However, the potential and opportunity for developing traditional fruit and vegetable processing cooperatives is limited by the continued decline in the number of farms and harvested acres, as well as competition from existing processors. Of the 208 processing plants operating in the study area, only 2 were identified as cooperatives.

Fruit and vegetable production is considered to be a somewhat minor enterprise, relative to row crop or livestock production. Traditional row crop and livestock enterprises compete strongly with fruit and vegetable production for limited farm resources. Producers frequently divert resources from labor-intensive horticultural production to either row crop or livestock enterprises when markets for the latter are favorable and producers consider these alternatives to be more profitable. Consequently, securing a constant supply of consistent-quality fruit and vegetable products can be a major problem for a cooperative processing facility.

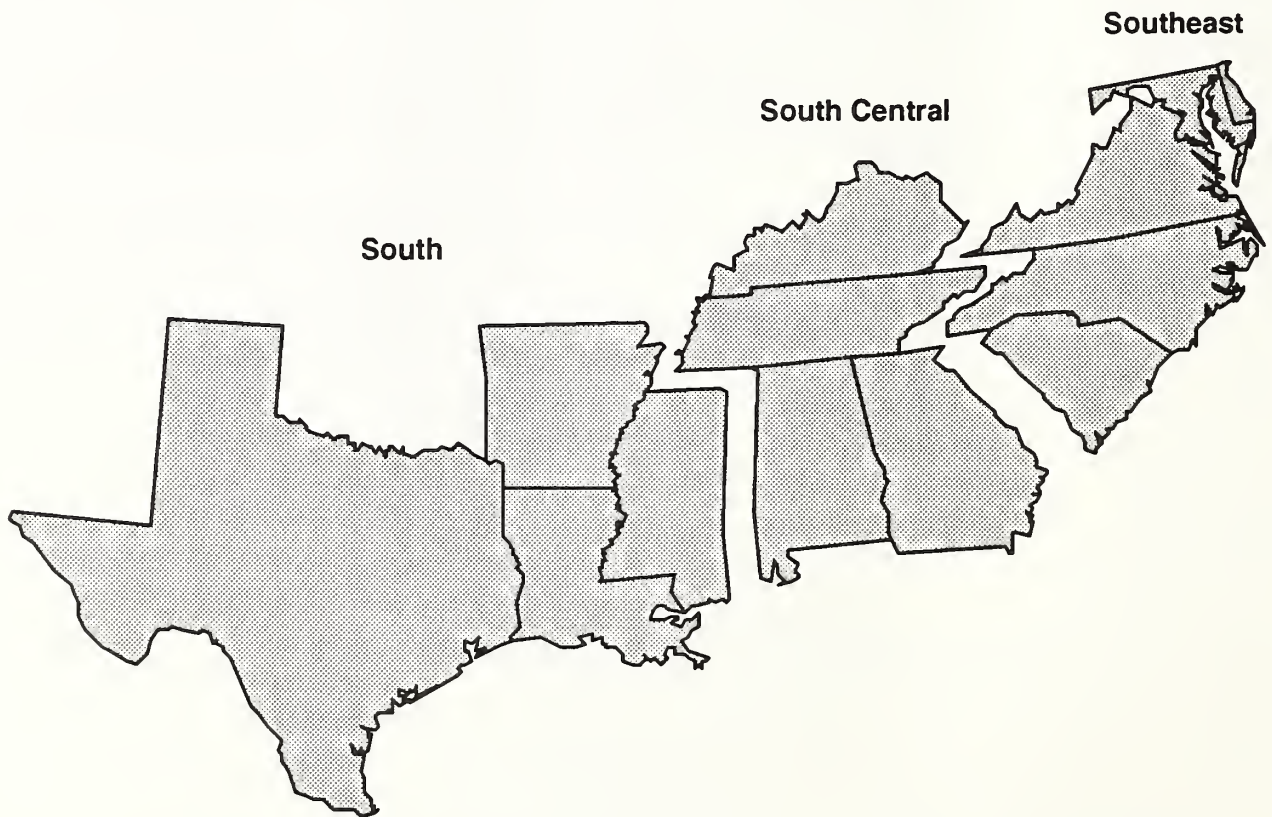
Another barrier is a relatively wide price differential between fresh and processing market outlets. Because most vegetables may be marketed in either fresh or processing outlets, producers respond to the more attractive alternatives. In general, the prices paid for fresh market produce exceed processing prices.

Fresh pre-cut, a relatively new alternative processing operation, offers opportunities for fruit and vegetable producers in the South and Southeast to develop and expand processing cooperatives and market outlets for their products.

However, these new firms and producer groups entering the pre-cut markets face many of the same marketing problems associated with traditional processing markets.

One approach to marketing in this new environment is to identify a niche based on the type of market served and product being offered.

Study Area Regions



Opportunities for Vegetable Processing Cooperatives in the South and Southeast

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INTRODUCTION

During the early 1980s, farm prices for major crops began to fall in response to weakening economic conditions. Decreased farm income resulted in increased financial stress and the prospect of having to exit farming became a very real possibility for many producers.

Farmers were encouraged to investigate alternative enterprises that would provide adequate income and enable them to continue operating. Consumers were becoming increasingly concerned about health and nutrition issues. Numerous studies identified the importance of incorporating fruits and vegetables into a balanced diet. The trend toward a more healthy diet had an impact on fruit and vegetable production, resulting in an increased demand for traditional produce as well as creating niche markets for specialty items.

Increased consumer awareness has led to a higher demand for produce in general and better prices for farmers. Fruit and vegetable production was soon recognized and promoted as an attractive alternative crop for many producers. Growing conditions in these regions were well suited for fruit and vegetable production. Existing farm systems could be switched to horticultural crop production.

Consequently, many southern growers began incorporating fruit and vegetable production into their overall farm plan. The increased supply also led to the formation of several new fresh fruit and vegetable cooperatives to facilitate the assembly, grading, marketing, and distribution of produce.

Growers soon recognized the problem of over-producing for the fresh market and began looking for outlets to market surplus and offgrade products. One solution identified was to channel excess

product into the processing market. Given the small-volume character of many of these operators, there appeared to be advantages for producers to secure and operate their own processing facilities.

Several studies dealing with the economic analysis of opportunities for canning selected vegetables—green beans, okra, dry beans, and squash—in the South were conducted by Mathia and Pearson in 1970. They concluded that vegetable processing plants could be profitably operated under selected conditions and capacities. The findings also suggested that vegetable canning may be a profitable way to achieve a broader industrial base and could complement the fresh market outlets for vegetable products commonly produced in the South.

This study evaluates the potential for vegetable processing cooperatives in the South and Southeast U.S. by identifying and analyzing factors such as industry size, geographic distribution and composition, concentration of population, number of farms, number of fruit and vegetable processing cooperative operations in the study area, and the potential for expanding production of selected vegetable crops.

OVERVIEW OF THE FRUIT AND VEGETABLE INDUSTRY

Fruit and vegetable processing is an important industry in the U.S. The ability to convert perishable produce into a stable form that can be stored and shipped to distant markets has greatly expanded the farm produce market. A 1989 report by USDA's Economic Research Service estimated that processed food valued at \$350 billion was shipped from U.S. processing plants to various wholesale

The industry is dominated by large nationwide corporations able to distribute risk over a number of commodities or among a number of plants located in large production areas, mainly the Pacific coast or Midwest. Cooperatives account for about 20-25 percent of the processing activities, are localized, and usually confine their operations to fewer products. Hence, most cooperatives have less opportunity for spreading risk geographically or in terms of products.

Fruit and vegetable processing has had one of the highest growth rates in the food processing industry. Much of it resulted from new technologies aimed toward convenience, cost reduction, and quality control. Consequently, a wide variety of new fruit and vegetable products have been created. Growth in the industry is further reflected in the production and per-capita consumption trends.

Fruit Production

During the decade of 1982-91, total fruit production in terms of acreage and tonnage for both citrus and noncitrus has been rather stable with only minor year-to-year variance. Citrus fruit experienced the most variance in production, especially during 1983-86 (table 1), because of adverse weath-

er conditions in California, Florida, and Texas. However, reports indicate that both Florida and California have rebounded well since the freeze in the 1980s. This could reverse or stabilize the decline in citrus acreage and increase tonnage.

As shown in table 1, the total number of acres in citrus fruit production decreased 18.2, percent from 1.1 million acres in 1982 to 0.9 million acres in 1991. Citrus fruit tonnage dropped 9.1 percent, from 12.1 million tons to 11 million tons. However, the dollar value of citrus increased 37.5 percent, from \$1.6 billion in 1982 to \$2.2 billion in 1991. Citrus fruit value peaked at \$2.7 billion in 1989.

Table 1 also shows the production trend for noncitrus fruit from 1982-1991. The number of acres and tons increased over the same 10-year period, contrary to the losses reported in the citrus sector. Total acres under production for noncitrus fruit increased 12.5 percent, from 1.6 million in 1982 to 1.8 million, in 1991. Tonnage increased from 14.7 million to 15.7 million (6.8 percent), and the dollar value for noncitrus output increased from \$3.8 billion in 1982 to \$5.5 billion in 1991 (44.7 percent).

The composition of fresh and processed use has also remained rather stable. Figures 1 and 2 for

Table 1—Total U.S. acreage, production and value for fruit ¹

Year	Citrus fruit	Noncitrus fruit	Citrus fruit	Noncitrus fruits	Citrus fruit	Noncitrus fruit
	-----1,000 acres-----		-----1,000 Tons-----		-----1,000 Dollars-----	
1982	1,124	1,640	12,139	14,658	1,616,603	3,870,147
1983	1,092	1,674	13,682	14,168	1,743,421	3,596,024
1984	1,008	1,704	10,832	14,301	1,755,300	3,694,901
1985	899	1,725	10,525	14,191	2,080,250	3,830,971
1986	819	1,728	11,058	13,874	1,768,496	4,203,597
1987	826	1,739	11,993	16,011	2,053,493	4,420,955
1988	833	1,748	12,761	15,893	2,618,574	5,096,627
1989	848	1,748	13,186	16,335	2,665,142	5,276,162
1990	890	1,756	10,845	15,605	2,208,340	5,470,119
1991	896	1,765	10,960	15,654	2,250,100	5,510,200

¹ Data from USDA/ERS Fruit and Tree Nuts Situation and Outlook Report Yearbook, but does not include tree nuts.

² 1982 represents base year.

Table 2—Total U.S. harvested acres, production and value of principal vegetables, 1982-91 ¹

Year	Acres <i>1,000</i>	Tons ² <i>1,000</i>	Value <i>1,000 Dollars</i>
1982	2,190	19,541	3,558,398
1983	2,158	18,303	3,664,193
1984	2,446	20,699	4,117,997
1985	2,467	20,549	3,950,724
1986	2,313	20,349	4,149,689
1987	2,431	21,699	4,572,396
1988	2,465	21,263	4,865,899
1989	2,620	24,604	5,426,340
1990	2,668	25,479	5,015,155
1991	2,655	25,645	5,277,606

¹ Data from NASS, USDA Annual Vegetable Reports.

² Represents metric tons.

citrus and noncitrus indicate more than 60 percent of the production was processed.

Vegetable Production

Vegetable production in the U.S. has grown modestly from 1982-1991, with slight yearly variations. Data in table 2 notes the number of harvested acres increased 22.7 percent, from 2.2 million in 1982 to about 2.7 million in 1991. Vegetable tonnage increased from 19.5 million in 1982 to 25.6 million in 1991 (19.7 percent). The value of vegetables increased from \$3.6 billion in 1982 to \$5.3 billion in 1991 (47.2 percent).

In addition to increased acreage, tonnage, and value, more than one-half the vegetable output has been produced for processing (figure 3). Data also indicate that from 1989-1991, an increasing percentage of output has gone for processing.

Figure 1—Distribution of U. S. Citrus Fruit Production., Fresh and Processed, 1982-91

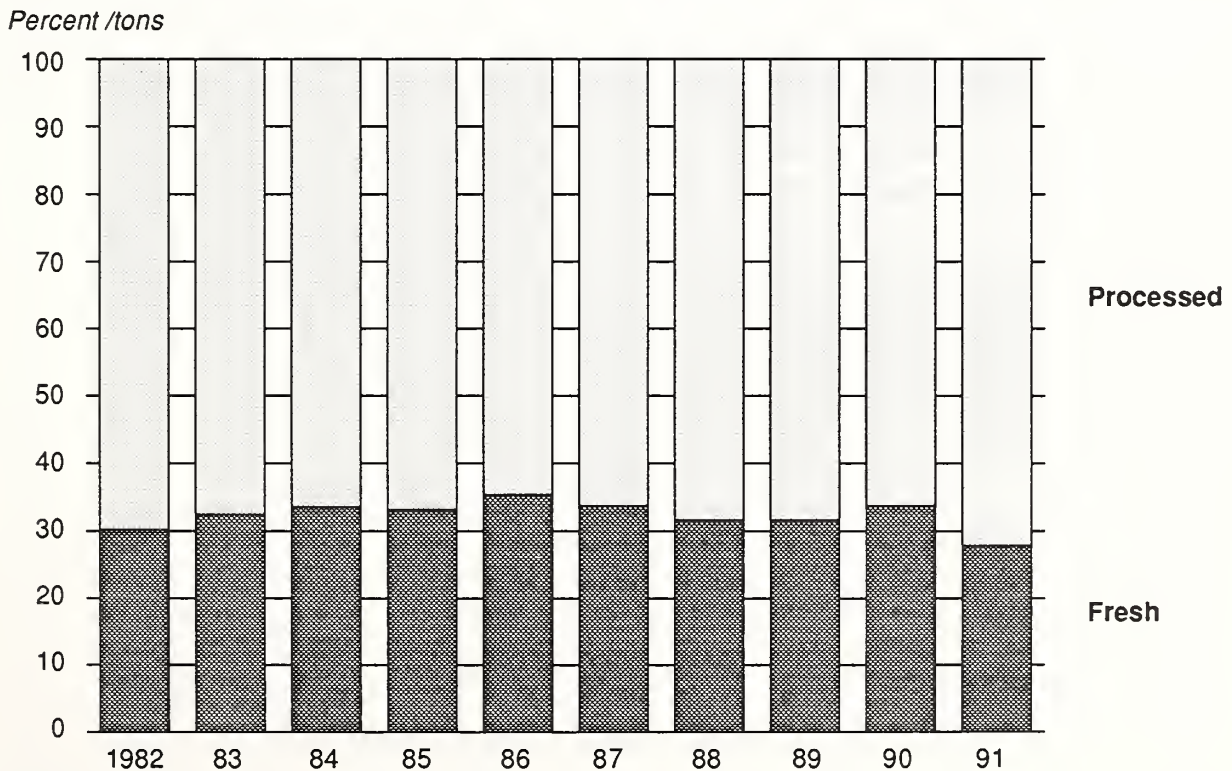


Figure 2—Distribution of U. S. NonCitrus Fruit Production, Fresh and Processed, 1982-91

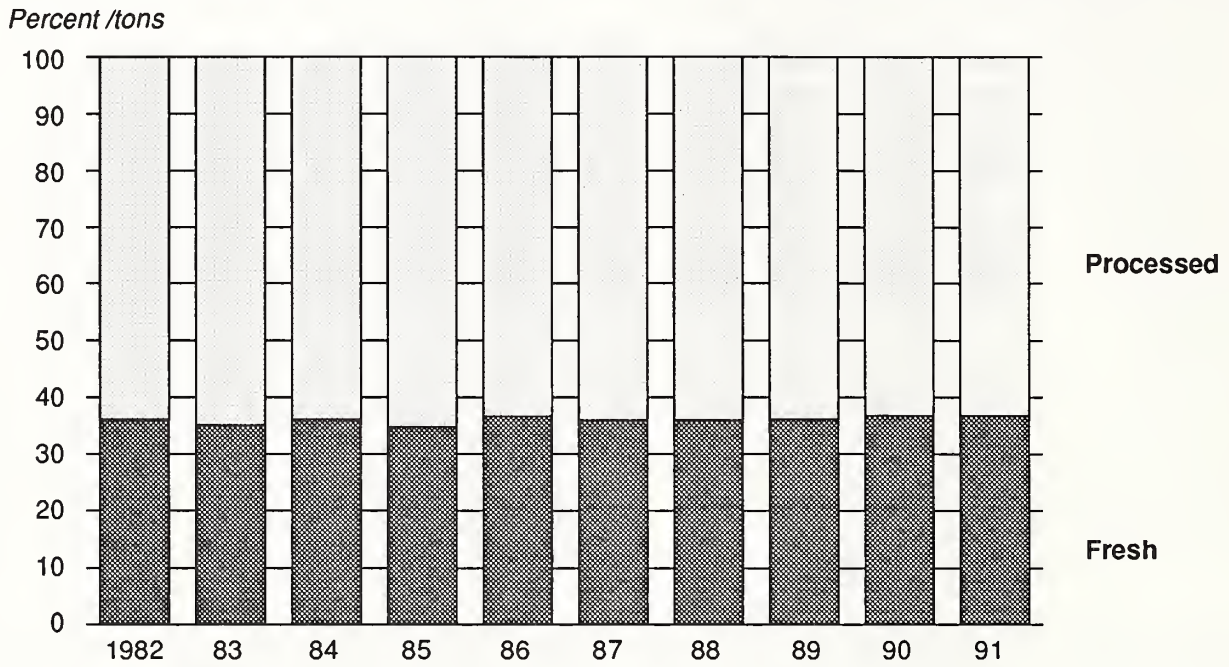
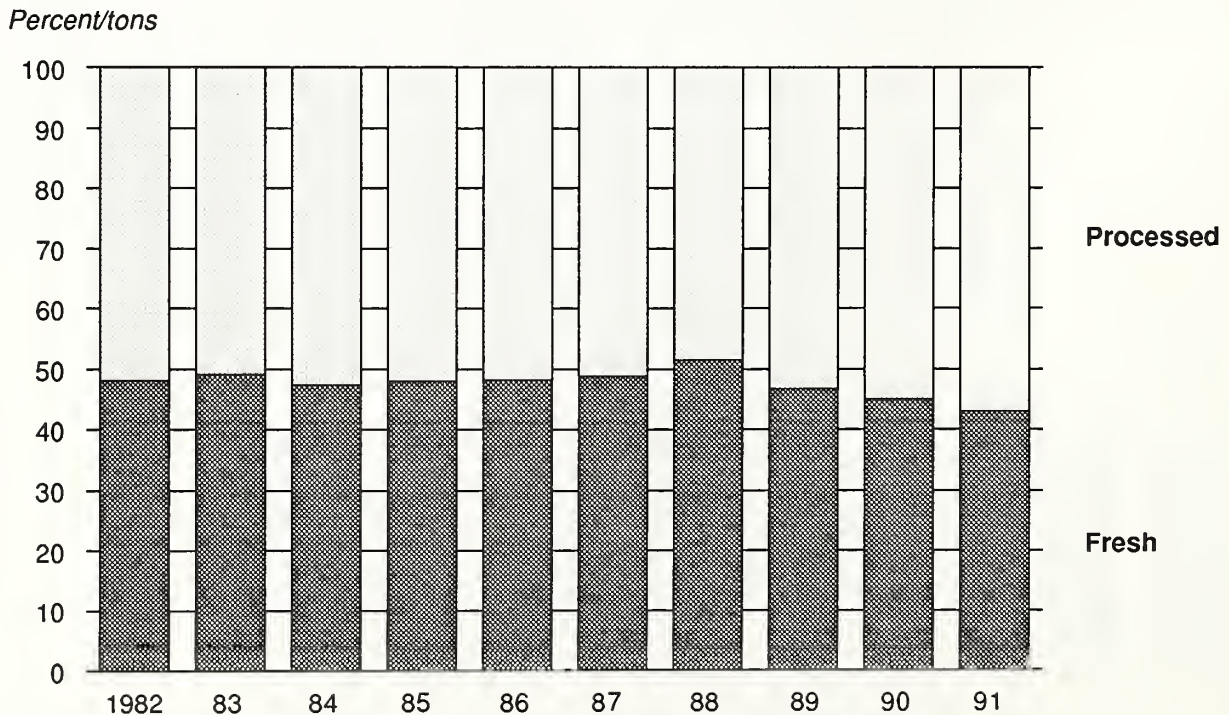


Figure 3—Distribution of U. S. Vegetable Production, Fresh and Processed, 1982-91



Per-Capita Consumption

Per-capita consumption of fruits and vegetables is another measure of the industry's condition. Table 3 shows per-capita consumption of citrus and noncitrus fruits, while table 4 shows per-capita consumption of vegetables for 1982-1990.

Data in table 3 indicate modest growth in per-capita consumption for all fruits (citrus and noncitrus) from 1982-1990 --198.5 pounds in 1982 to more than 200 pounds in 1990.

Per-capita consumption of citrus fruit is slightly higher than noncitrus. From 1982-1990, per-capita consumption of citrus fruit ranged between 102.8 pounds in 1984 and 120 pounds in 1983, compared with noncitrus of 88.7 pounds in 1983 and 101.5 pounds in 1987.

While there is a small difference in total consumption of citrus and noncitrus fruits, there is a major difference in consumption between fresh and processed. For citrus, between 75-80 percent of consumption is in processed form, reflecting a high

percent of citrus going into juice, while for noncitrus, only 25-30 percent is consumed in a processed form.

Total U.S. per-capita consumption of vegetables, similar to fruits, has gained modestly from 1982-1990. Vegetable consumption also reached more than 200 pounds during the period (table 4).

Per-capita consumption of processed vegetables is slightly higher than for fresh. However, both fresh and processed vegetable consumption increased more than 10 pounds during 1982- 1990. Total consumption for both topped 100 pounds. Per-capita consumption of fresh vegetables increased from 80.9 pounds in 1981 to a high of 101 pounds in 1989. Total per-capita consumption of processed vegetables increased from 92.4 pounds in 1982 to a high of 110.7 pounds in 1990.

CHARACTERISTICS OF THE STUDY AREA

The characteristics and resources are an important consideration in evaluating the potential

Table 3—Total U.S per capita consumption of citrus and noncitrus fruits, 1982-90 ¹

Year	Citrus			Noncitrus		
	Total	Fresh	Processed	Total	Fresh	Processed
	-----Pounds-----			-----Pounds-----		
1982	109.3	24.7	84.6	89.2	62.2	27.0
1983	120.0	29.3	90.7	88.7	62.7	26.0
1984	102.8	24.0	78.8	93.4	67.6	25.8
1985	109.1	23.4	85.7	91.5	66.5	25.0
1986	117.2	26.7	90.5	96.4	69.2	27.2
1987	112.8	26.4	86.4	101.5	75.1	26.4
1988	113.6	26.5	87.1	97.7	70.4	27.3
1989	112.8	25.4	87.4	98.3	72.3	26.0
1990	111.8	22.4	89.4	98.1	72.1	26.0

¹ Data from USDA/ERS Fruit and Tree Nuts Situation and Outlook Report Yearbook. Data does not include tree nuts.

² Include citrus and non-citrus fruits.

Table 4—U.S. per capita consumption of vegetables ¹

Year	Total	Fresh	Processed
		<i>Pounds</i>	
1981	181.0	80.9	100.1
1982	177.4	85.0	92.4
1983	176.4	82.5	93.9
1984	197.7	89.6	108.1
1985	195.0	90.5	104.5
1986	194.4	90.9	103.5
1987	199.3	95.4	103.9
1988	199.7	98.7	101.0
1989	208.4	101.0	107.4
1990	205.9	95.2	110.7

¹ Data from ERS, USDA Vegetables and Specialties, Situation Outlook Report.

for developing and expanding fruit and vegetable processing cooperatives in this section of the U.S.

Each of the three study regions (South, South Central, and Southeast) have many of the essential characteristics needed for the successful development and operation of fruit and vegetable processing cooperatives. The area has abundant productive land, ample water for irrigation, well-financed farm units providing the needed resources for fruit and vegetable production, and a large and growing population.

Major Farming Enterprises

Livestock and row crops are the major farming enterprises in the study area. Farmers currently receive most of their farm income from them. Table 5 indicates livestock and livestock products accounted for 60 percent of farm income in 1990 and row crops about 36 percent for the same period. For six of the States, row crops, such as corn, cotton, tobacco, soybeans, peanuts, and wheat, represent more

Table 5—Cash receipts distribution by commodity groups in the study area and as percent of U.S., 1990 ¹

State/Region	Livestock & products	Field Crops	Vegetables	Fruits
	<i>Percent</i>			
Arkansas	63.5	35.7	0.4	0.3
Louisiana	33.1	63.7	2.4	0.7
Mississippi	54.3	43.7	1.4	0.6
Texas	64.4	30.5	4.4	0.8
South	60.1	36.2	3.0	0.6
Alabama	76.1	20.5	2.9	0.5
Georgia	59.0	32.5	5.3	3.1
Kentucky	54.8	44.3	0.6	0.2
Tennessee	54.5	42.8	2.3	0.4
South Central	61.1	34.6	3.0	1.3
Delaware	74.9	17.4	7.2	0.4
Maryland	61.6	33.0	4.5	1.0
N. Carolina	54.5	40.5	4.1	0.9
S. Carolina	49.1	43.0	5.4	2.5
Virginia	65.0	29.2	4.4	1.4
Southeast	58.5	35.8	4.6	1.2
Total study area	60.0	35.7	3.4	0.9
Total U.S.	52.7	35.0	6.8	5.5

¹ Data source, USDA-ERS.

than 40 percent of farm income. These enterprises are relatively stable. Price risk is reduced because of Government support programs in these crops.

Although the study area has a long tradition of producing fruits and vegetables, the volume and subsequent income derived are small compared with other areas, such as the Pacific coast or Midwest.

Population

The South region has a slightly higher population because it contains Texas which has large urban centers. More than a quarter of the U.S. population--67 million--lives in this 13-State sector (table 6). Regional data show a relatively even distribution of the population. Population growth of 12.1 percent for the study area exceeded the 10.2 percent U.S. level from 1980-1990 (table 6).

Number of Farms

In 1990, 34.8 percent of all 2.1 million U.S. farms were located in the study areas (table 7). Based on the 1987 Census of Agriculture data, the area contained slightly less than one-third of the total 60.8 thousand U.S. vegetable farms (table 8). Data in tables 7 and 8 also show that each of the study regions are well represented in terms of farm numbers. The region with the largest concentration of all farms is the South, although the Southeast has more vegetable farms.

The study area has a sufficient production base to expand existing farming operations and develop new fruit and vegetable supplies, but the number of farms in these regions continues to decline. This trend is consistent with the national decline. However, farms in the study area are declining at a faster rate than for the Nation as a whole. Table 7 shows that during 1980-90 the number of farms nationwide was down 13.7 percent, compared with 15.6 percent for the study area.

Existing Processing Activities

The years 1930-50 witnessed considerable growth of new canning facilities throughout the South and Southeast. Some were small, community-based operations that depended on local farms for supplies of raw products. Since 1945, many of these small plants have closed. Although total volume of vegetables processed by these firms was small compared with the national supply, their failure had a serious impact on local vegetable producers, who often had no alternative market for their produce.

The number of processing establishments in the study area increased from 126 to 213 during 1977-82 (table 9). Most processing plants (130) canned fruits and vegetables. From 1982-1987, the number of these plants decreased to 102. Total processing plants dropped from 213 to 208.

Of these 208, only 2 were identified as cooperative businesses. Processing activities of these plants in the study area included canned fruits and vegetables, dehydrated fruits and vegetables, pickles and sauce, and frozen fruits and vegetables.

Most plants (102) canned fruits and vegetables. Another 75 handled pickles and sauce. Only eight handled dehydrated fruits and vegetables. Table 10 shows the regional concentration of the 208 processing plants--84 in the Southeast, 77 in the South, and 47 in the South Central region.

Existing processing plants are larger and more technically advanced and efficient than those that operated 20-30 years ago. The 208 processing plants handled 29 different fruits and vegetables. Most are multi-crop operations.

Raw Products for Existing Plants

Purchasing raw products for their plants is a major concern for existing fruit and vegetable processors. Traditionally, processors located their plants near the source of supply and contracted with local growers. But, production changes in the South and Southeast since the present plants were established has forced processors to contract with producers 300-500 miles away.

Some processors truck produce from long distances to extend the season and improve operating efficiency or to secure specialty produce. Many processors supplement their contract purchases by growing part of their commodity needs on land they own or lease. This helps guarantee access to production in sufficient quantity and quality to efficiently operate the plant.

The practice of contracting acreage is generally in the best interest of both parties. Contracts enable processors to regulate supply. Growers are guaranteed a market before new resources are committed to the production of any crop.

Table 6—Number and distribution of population in study area and as a percent of U.S. ¹

Region/State	Population				Change in Population 1980 to 1990
	1980	1990	1980	1990	
	-----1,000-----		-----Percent-----		
United States	226,542	249,633	—	—	10.2
Study area:					
South:					
Arkansas	2,286	2,362	3.81	3.51	3.2
Louisiana	4,206	4,238	7.01	6.31	0.8
Mississippi	2,521	2,586	4.20	3.84	2.5
Texas	14,226	17,060	23.71	25.36	16.6
Total	23,239	26,246	38.73	39.02	11.5
South Central:					
Alabama	3,894	4,063	6.49	6.04	4.2
Georgia	5,463	6,508	9.10	9.68	16.1
Kentucky	3,660	3,699	6.10	5.51	1.1
Tennessee	4,591	4,897	7.65	7.28	6.2
Total	17,608	19,167	29.34	28.51	8.1
Southeast:					
Delaware	594	669	0.99	0.99	11.2
Maryland	4,217	4,799	7.03	7.13	12.1
N. Carolina	5,880	6,658	9.80	9.90	11.7
S. Carolina	3,121	3,506	5.20	5.21	11.0
Virginia	5,347	6,217	8.91	9.24	14.0
Total	19,159	21,849	31.93	32.47	12.3
Grand total	60,006	67,262	100.00	100.00	12.1
Study area as % of U.S.	—	—	26.49	26.94	—

¹ Based on the Census of Population, 1980 and 1990.

Table 7—Number and distribution of all farms in study area and as a percent of U.S. ¹

Region/State	All Farms				Change in All Farms 1980 to 1990
	1980	1990	1980	1990	
	-----Number-----		-----Percent-----		
United States	2,439,510	2,104,560	—	—	-13.7
South:					
Arkansas	59,000	47,000	6.8	6.4	-20.3
Louisiana	37,000	32,000	4.3	4.4	-13.5
Mississippi	55,000	40,000	6.3	5.5	-27.3
Texas	196,000	186,000	22.6	25.4	-10.0
Total	347,000	305,000	39.9	41.6	-12.1
South Central:					
Alabama	59,000	47,000	6.8	6.4	-20.3
Georgia	59,000	48,000	6.8	6.5	-18.6
Kentucky	102,000	93,000	11.7	12.7	-8.8
Tennessee	96,000	89,000	11.0	12.1	-7.3
Total	316,000	277,000	36.4	37.8	-12.3
Southeast:					
Delaware	3,500	2,900	0.4	0.4	-17.1
Maryland	17,500	15,200	2.0	2.1	-13.1
N. Carolina	93,000	62,000	10.7	8.5	-33.3
S. Carolina	34,000	25,000	3.9	3.4	-26.5
Virginia	58,000	46,000	6.7	6.3	-20.7
Total	206,000	151,100	23.7	20.6	-26.7
Grand total	869,000	733,100	100.0	100.0	-15.6
Study area as % of U.S.	—	—	35.6	34.8	—

¹ Based on NASS, USDA Farm Numbers Land in Farm reports.

Table 8—Number and distribution of vegetable farms in study area and as a percent of U.S. ¹

Region/State	Vegetable Farms				Change in Veg. Farms 1982 to 1987
	1982	1987	1982	1987	
	-----Number-----		-----Percent-----		
United States	69,109	60,819	—	—	-13.5
South:					
Arkansas	917	720	3.78	3.85	-27.4
Louisiana	999	689	4.12	3.68	-45.0
Mississippi	1,363	767	5.62	4.10	-77.7
Texas	3,434	3,237	14.17	17.29	-6.1
Total	6,713	5,413	27.70	28.91	-24.0
South Central:					
Alabama	2,241	1,365	9.25	7.29	-64.2
Georgia	2,801	1,958	11.56	10.46	-43.1
Kentucky	1,549	1,697	6.39	9.06	8.7
Tennessee	2,070	1,300	8.54	6.94	-59.2
Total	8,661	6,320	35.73	33.75	-37.0
Southeast:					
Delaware	367	317	1.51	1.69	-15.8
Maryland	1,403	1,184	5.79	6.32	-18.5
N. Carolina	3,938	3,023	16.25	16.14	-30.3
S. Carolina	1,645	1,265	6.79	6.76	-30.0
Virginia	1,510	1,203	6.23	6.42	-25.5
Total	8,863	6,992	36.57	37.34	-26.8
Gand total	24,237	18,725	100.00	100.00	-29.4
Study area as					
% of U.S.	—	—	35.1	30.8	—

¹ Based on the Census of Agriculture, 1982 and 1987.

Table 9—Processing establishments by type of processors located in study area ¹

Type of Processor	Establishments					
	1977			1982		
	Number	Percent	Number	Percent	Number	Percent
Canned Fruits and Vegetables	73	130	102	57.9	61.0	49.0
Dehydrated fruit & Vegetables	1	—	8	0.8	—	3.8
Pickle and sauce	40	65	75	31.7	30.5	36.1
Frozen fruits and vegetables	12	18	23	9.5	8.5	11.1
Total	126	213	208	100.0	100.0	100.0

¹ Data from the Census of Business, U.S. Department of Commerce. Reflecting establishments with 20 or more employees.

Table 11 shows harvested acres of selected vegetables in the U.S. for processing by type of procurement from 1982-91. Most acres were under contract to processors, with produce from only a limited number of acres available for sale in the open market. While individual State data is not available, indications are that most of the processed vegetable acreage for these crops in these States is also under contract.

OPPORTUNITIES FOR PROCESSING COOPERATIVES

United States

People form cooperatives to obtain services they can't get as economically as individuals can. The cooperative provides the structural basis for them to voluntarily act or operate in joining human, physical or natural material, and financial resources to achieve an end, such as increasing net returns to prospective members.

A 1971 analysis of U.S. fruit and vegetable cooperative processors by USDA's Agricultural Cooperative Service (ACS) reported that 47 farmer cooperatives annually processed more than 50

Table 10—Fruit and vegetable processing plants in study area by region and U.S. ¹

Region	1977			1982		
	Number			Percent		
	Number	Percent	Number	Percent	Number	Percent
South	45	78	77	35.7	36.6	37.0
South Central	34	53	47	27.0	24.9	22.6
Southeast	47	82	84	37.3	38.5	40.4
Grand Total	126	213	208	100.0	100.0	100.0
United States	967	1,506	1,418	—	—	—
Study area as % of U.S.	13.0	14.1	14.7	—	—	—

¹ Data from the Census of Business, U.S. Department of Commerce. Number of establishments with 20 or more employees.

types of fruits and vegetables in bottled, canned, dried, and frozen form at more than 100 plants. Total pack value approached \$2 billion.

These 47 cooperative processors were located in 16 States concentrated mostly in the West, North Central, and Northeast. These cooperatives handled about 20 percent of all fruits, vegetables, and juice processed in the U.S.

About 2 decades later (1990), 41 fruit and vegetable cooperatives owned and operated processing facilities (table 12). Most are concentrated in the West. California leads all States with 12 cooperative processors, Oregon has 6, and Washington has 4. In the North Central and Northeast, most processors were in Michigan and Pennsylvania. Nationwide, there were 122 cooperative plants. Each processor had two or more plants located in several cities and some across State lines.

Cooperatives have a combination of processing activities--canning, canning and freezing, and freezing and drying. Six of the cooperatives process both fruits and vegetables, 32 process only fruits, and three only vegetables. Another 21 fresh-market fruit and vegetable cooperatives sold to processors, including several small fresh-market cooperatives in the study area.

Table 11—Harvested acres of selected vegetables by type of procurement in U.S. for 1982-91 ¹

Crop	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
	<i>Acres</i>									
Beans, Snap										
Contract	192,230	184,650	200,600	206,480	178,990	200,170	193,900	237,710	226,130	221,030
Open Market	12,180	12,080	16,040	15,680	11,570	21,040	23,750	11,290	20,000	12,420
Sweet Corn										
Contract	445,200	398,200	425,600	433,900	412,980	430,320	445,200	461,950	489,580	539,460
Open Market	1,700	1,600	1,600	1,400	400	600	1,000	2,500	500	2,800
Cucumbers										
Contract	0	0	85,550	96,060	92,100	90,890	96,000	103,850	102,060	89,570
Open Market	0	0	18,030	18,340	18,410	18,740	22,870	20,320	13,430	14,270
Peas, Green										
Contract	303,830	308,800	330,470	353,220	271,620	288,500	283,900	315,200	341,100	332,200
Open Market	0	0	0	400	800	1,800	0	1,300	0	500
Tomatoes										
Contract	285,770	284,120	287,320	260,940	248,410	252,700	268,960	313,880	348,060	350,960
Open Market	9,530	7,900	4,550	4,560	3,650	4,400	5,960	6,970	6,640	5,020

¹ Data from NASS, USDA Vegetable annual reports.

South and Southeast

By the mid-1960s, most of the farmer-owned canneries had ceased operation. This largely resulted from producers placing more emphasis on traditional crops such as corn, soybeans, cotton, tobacco, peanuts, and wheat because of their greater per-acre return. These canneries also died because plants operated by noncooperatives were larger and more efficient. However, few of these farmer-owned canneries were formerly organized as cooperatives.

As of 1987, the latest data available, there were about 208 commercial fruit and vegetable processing plants operating in the South and Southeast, not including Florida. Only two were identified as being owned and operated as a cooperative.

In 1989, during the initial stage of this study, on-site visits and telephone contacts were made to fruit and vegetable processors to identify the number and types of processing cooperatives. Only two cooperative plants were operating, unchanged since 1987.

The success of any organized effort to develop fruit and vegetable processing cooperatives in the South and Southeast will depend largely on the continued importance of row crops to farmers. More importantly, farmers must make a serious commitment to produce the fruit, vegetable, and other specialty crops that can be grown in the study area.

Reallocating production resources from major row crop enterprises to alternative crop enterprises, especially fruits and vegetables, would have a

Table 12—Fruit and vegetable processing cooperatives, 1991 ¹

Type of Activity	Number of Associations
Own Processing Facilities	41
Sell to Processors	21
Processed Fruits and Vegetables	6
Processed Fruits Only	32
Processed Vegetables Only	3

¹ Reflects data from ACS, USDA data file and the Directory of Canning, Freezing, Preserving Industries.

positive impact on the area's capability to develop and expand its processing operations.

Production Trends Table 13 shows the production trends of six major row crops based on harvested acres in the 13-State study area from 1982-91. Total harvested acres have declined. Except for cotton and peanuts, individual crop acres also have declined. This is likely due to both decreased farm numbers and reduction in harvested acreage.

The production trends for the major fruits and vegetables grown in the study area are similar to those for row crops, although complete data is not available by State. However, based on 1982-91 data, total harvested acres for fruit and vegetable crops has declined (tables 14 and 15). Also, acreage for each of the three fruit commodities (apples, grapes and peaches), and each of the five vegetable commodities (snap beans, sweet corn, cucumbers, green peas, and tomatoes) has declined during this decade.

Table 13—Harvested acres of major fields crops in study area ¹

Year	Corn	Cotton	Tobacco	Soybeans	Peanuts	Wheat	Total
<i>1,000 acres</i>							
1982	8,002	7,159	849	25,300	1,130	14,639	57,079
1983	6,289	5,621	733	20,885	1,211	10,810	45,549
1984	8,618	7,866	737	21,305	1,348	11,149	51,023
1985	9,063	7,898	641	18,245	1,300	10,368	47,513
1986	8,234	6,564	540	15,220	1,348	8,499	40,405
1987	6,664	7,820	548	14,345	1,353	10,603	41,333
1988	6,145	9,341	595	14,530	1,428	10,818	42,857
1989	6,226	7,360	635	15,295	1,441	8,449	39,406
1990	6,540	9,468	679	14,129	1,590	9,720	42,126
1991	6,409	10,518	712	12,430	1,768	6,692	38,529

¹ Based on NASS, USDA annual crop production reports.

Table 14—Bearing acres of major fruit crops grown in study area ¹

Year	Apples	Grapes	Peaches	Total
<i>Acres</i>				
1982	49,500	6,150	63,800	119,450
1983	49,200	6,000	66,700	121,900
1984	46,400	6,000	69,500	121,900
1985	45,600	5,550	69,900	121,050
1986	45,300	5,110	66,600	117,010
1987	44,600	5,100	64,000	113,700
1988	44,600	5,000	59,400	109,000
1989	44,000	4,860	60,300	109,160
1990	43,500	4,840	61,800	110,140
1991	43,800	5,020	61,400	110,220

¹ Noncitrus Fruits and Nuts annual reports, NASS,USDA.

Other contributing factors are the average size of vegetable farms in the study area and availability of labor. The farm size, less than 60 acres, eliminates the use of mechanical planting and harvesting equipment, both from a physical and economic consideration.

However, the decline in harvested acreage for row crops doesn't mean these crops are becoming less important to farmers, or that they are shifting resources to fruits and vegetables. The tendency for farmers to concentrate on these products greatly reduces the potential for developing and expanding processing cooperatives in the study area. This is especially true, considering most major vegetable crops grown in the study area are under contract to other processors.

If there has been a major shift of resources by producers in this area from row crops to the production of alternative crops (fruits and vegetables), it may indicate an opportunity to organize farmer-owned cooperatives.

Selecting Commodities for Evaluation One problem faced in studying the feasibility of production and processing in an area is the

Table 15—Harvested acres of selected vegetables grown in study area ¹

Year	Beans Snap	Sweet Corn	Cucumbers	Peas Green	Tomatoes	Total
<i>Acres</i>						
1982	14,606	28,700	0	11,000	38,071	92,377
1983	8,280	27,700	0	12,300	32,281	80,561
1984	8,408	29,700	47,206	14,000	32,363	131,677
1985	10,007	29,700	54,206	14,300	32,213	140,426
1986	7,907	28,400	50,106	9,601	27,985	123,999
1987	8,407	28,100	49,907	9,701	27,175	123,290
1988	9,607	25,000	51,209	7,701	29,584	123,101
1989	7,900	24,100	55,700	8,100	25,080	120,880
1990	7,700	25,900	45,000	8,800	25,400	112,800
1991	5,000	25,600	37,000	8,000	25,700	101,300

¹ Based on NASS,USDA Vegetable annual reports.

selection of commodities to be analyzed. Ideally, a wide range of commodities should be examined in detail, yet practical considerations suggest only a limited number should be scrutinized.

For this purpose, five vegetable commodities (table 15), snap beans, sweet corn, cucumbers, green peas, and tomatoes, were analyzed because they were the principal vegetable crops produced in the area. These crops are also being grown in various combinations by member producers of 16 small fresh vegetable marketing cooperatives in the study area. These commodities are grown for both fresh and processed markets and most are suitable for canning and freezing operations.

These commodities also met the requirements for a multiple-product plant operation, but may not allow for a production and processing schedule that maximizes the operating season. However,

from a technical standpoint, many other fruits and vegetables could be grown in sufficient volume to support a processing operation. For instance, apples, peaches, carrots, and squash are produced in the study area in ample quantity and could complement the selected commodities to support the processing operation.

Table 16 shows the regional concentration of the five principal vegetable crops. All three regions have some level of production of all five crops. However, based on the limited State data, sweet corn and tomato production acres are concentrated in all three regions, while snap bean and green pea production acres are concentrated in the South Central and Southeast.

Table 17 shows the regional concentration of acreage and tonnage for all vegetables grown in the study for 1991. The five principal vegetable crops

Table 16—Harvested acres of selected five principal vegetables by region, 1991¹

Region	Beans Snap	Sweet Corn	Cucumbers	Peas Green	Tomatoes	Total
<i>Acres</i>						
South	(²)	1,600	5,500	(²)	4,100	11,200
South Central	5,000	3,200	(²)	(²)	10,100	18,300
Southeast	(²)	20,800	31,500	8,000	11,500	71,800
Grand total	5,000	25,600	37,000	8,000	25,700	101,300

¹ Based on data from NASS-USDA Vegetable reports.

² Data not reported by NASS-USDA.

Table 17—Harvested acres and tons of selected vegetables grown in study area by region, 1991¹

Region	Total	Fresh	Processed	Total	Fresh	Processed
<i>Acres</i>			<i>Tons</i>			
South	55,970	39,100	16,870	397,396	333,562	63,834
South Central	29,600	19,300	10,300	157,097	132,037	25,060
Southeast	92,800	18,740	74,060	422,818	167,371	255,447
Grand Total	178,370	77,140	101,230	977,311	632,970	344,341
United States	2,654,550	1,086,320	1,568,230	25,644,760	11,011,510	14,633,250
Study area as % of U.S.	6.7	7.1	6.5	3.8	5.7	2.4

¹ Based on NASS,USDA annual reports.

represent the majority of acreage and tonnage. Of the three regions, the Southeast has a larger share of acreage and tonnage.

The study area has more acres in production for processed vegetables than fresh. Of the total 178,370 harvested acres in the study area, 101,230 were devoted to processed vegetables compared with 77,140 for fresh. Of the 101,230 processed acres, 74,060 were in the Southeast.

While more acres were allocated to processed vegetable production, fresh vegetables had more tonnage. Of the total 977,311 tons of vegetables produced in the study area, 632,970 were for fresh market consumption, compared with 344,341 tons for processed. The largest concentration of all vegetable tonnage, particularly processed vegetable tonnage (255,447), was in the Southeast.

Selecting the Kind of Processing The availability of commodities, demand for the product, and market outlook may dictate the type of processing operation. Another important factor is per-capita consumption trends of selected commodities (table 18).

All of the five commodities selected for evaluation—snap beans, sweet corn, cucumbers, green peas, and tomatoes—are adaptable to some form of canning process. Snap beans, sweet corn, and green peas are suitable to both canning and freezing operations.

Both snap beans and sweet corn are adaptable to canning and freezing processing operations. Consumption of the canned product is higher than the frozen product. Consumption of the canned or

Table 18—U.S. per capital consumption of selected vegetables ¹

Years	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
Snap bean										
canning	4.6	4.2	4.1	3.7	3.8	3.9	3.8	3.8	3.9	3.7
freezing	<u>1.7</u>	<u>1.5</u>	<u>1.5</u>	<u>1.8</u>	<u>1.9</u>	<u>1.5</u>	<u>1.7</u>	<u>1.7</u>	<u>1.9</u>	<u>1.9</u>
Total	6.3	5.7	5.6	5.5	5.7	5.4	5.5	5.5	5.8	5.6
Sweet Corn										
Fresh	6.2	6.0	6.1	6.4	6.4	6.1	6.3	5.7	6.4	6.4
Canning	12.2	11.6	11.6	10.2	11.9	12.1	10.8	10.4	9.5	10.9
Freezing	<u>6.3</u>	<u>5.8</u>	<u>6.6</u>	<u>8.0</u>	<u>7.9</u>	<u>7.6</u>	<u>7.8</u>	<u>8.7</u>	<u>8.4</u>	<u>8.5</u>
Total	24.7	23.4	24.3	24.6	26.2	25.8	24.9	24.8	24.3	25.8
Cucumbers										
Pickles	5.0	5.1	5.2	5.2	5.8	5.3	5.2	5.3	5.2	5.2
Green Peas										
Canning	2.7	2.5	2.4	2.0	2.1	2.2	2.0	1.7	1.7	1.9
Freezing	<u>1.7</u>	<u>1.7</u>	<u>1.8</u>	<u>2.0</u>	<u>2.1</u>	<u>1.9</u>	<u>1.7</u>	<u>1.9</u>	<u>2.0</u>	<u>2.2</u>
Total	4.4	4.2	4.2	4.0	4.2	4.1	3.7	3.6	3.7	4.1
Tomatoes										
Fresh	12.3	12.5	12.6	14.3	14.9	15.9	15.8	16.8	16.8	15.4
Canning	<u>59.3</u>	<u>60.1</u>	<u>60.9</u>	<u>68.5</u>	<u>63.2</u>	<u>63.6</u>	<u>65.2</u>	<u>61.3</u>	<u>69.4</u>	<u>70.0</u>
Total	71.6	72.6	73.5	82.8	78.1	79.5	81.0	78.1	86.2	85.4

frozen green peas over the past 6-7 years has been about equal. The growth market in coming years will be in frozen products, largely due to the health consciousness of Americans as well as improved technology.

Grower Commitment Producing fruits and vegetables consistently over a long period of time has been difficult for farmers raising major row crops. Generally, fruit and vegetable enterprises, especially vegetables, are relatively easy to enter and exit and highly labor intensive. Their survival depends on the economic condition of other enterprises. To make a processing cooperative successful, farmers must seriously commit to producing those fruits, vegetables, and specialty crops grown in the study area.

The commitment to develop a processing cooperative could come from the leadership and resources of 16 small fresh fruit and vegetable marketing cooperatives in the study area (table 19). They have about 435 member producers, cultivate about 3,200 acres, and have a history of producing all of the major fruits and vegetables grown in the area.

However, before these cooperatives and producer members seriously consider developing processing cooperatives, they must make a strong commitment to support the cooperative by increasing production and producing the quality and varieties of crops needed.

Any inclination to look at a processing operation as merely an alternative to the fresh market should be dispelled. Processing plants can neither operate profitably while waiting for a fresh market price break before they can begin processing, nor use the culls from fresh market operations.

Securing Raw Products A well-managed processing plant must discriminate in its selection of raw products. It must maintain a fairly rigorous quality-control program over its finished product. Therefore, buying an adequate supply of quality raw product is important. Products must move to the plant to suit both efficient harvesting and processing.

Table 19—Small fresh fruit and vegetable marketing cooperatives in the study area by region, 1990-91¹

Region	Co-ops	Members	Acres
		<i>Number</i>	
South	5	60	320
South Central	6	300	2,500
Southeast	5	75	400
Grand Total	16	435	3,220

¹ Data reflects records from ACS, USDA computer files.

Production of the major share of the raw product needs of a cooperative processing plant would occur under marketing agreements with individual member-producers. Marketing agreements enable management to more closely regulate supply from members. The agreement would also specify varieties and cultural practices to provide the cooperative with the highest quality and quantity of raw product. Planting dates must be specified after careful planning to provide for a steady flow of raw product to coincide with the processing plant production schedule.

During the initial years, part of the raw product supplies will probably be grown by the cooperatives on land they own or lease. This arrangement would help guarantee ample quality supplies while also serving as a demonstration site for current and potential growers in the area.

Marketing the Products The ability to market production from a new processing facility is equally important to determining the feasibility of organizing a plant or scheduling adequate sources of raw products.

Therefore, a market feasibility study should be conducted to determine potential markets and marketing strategies for the new cooperative venture. Potentially, any new facility in the study area would be surrounded by a large and growing population, a large commercial and industrial base, and the presence of Federal and State institutions.

Conversely, competition from existing processors and market outlets would naturally develop.

A new cooperative venture should not assume that unlimited quantities of processed commodities can be sold at prevailing market prices. Four broad marketing options are open to a new processing plant:

1. Pack for an established processor under a contract that specifies labels, price, package size, quantity, and quality standards.
2. Pack for a retail food chain or distributor under a contract that specifies conditions similar to a contract with another processor.
3. Pack under the new firm's own brand or label and directly compete with existing processors.
4. Some combination of the above.

Each option has its advantages and disadvantages. A decision to pack for either an existing processor or retail chain relieves the new firm of many problems associated with marketing a new product.

However, the contractual arrangement usually restricts a firm's flexibility. Contracts are typically renegotiated annually and subsequent arrangements may not be as favorable to a fledgling operation. Heavy dependence on a limited number of outlets will place a new firm in a weak bargaining position.

A decision to conduct the full range of marketing activities implies a sizable investment in sales personnel, advertising, and other related activities needed to introduce a new product. A unique label with a new "brand name" will be required along with a marketing strategy to gain acceptance of an unknown product.

If the new firm decides to do its own selling, it must either train a direct sales staff or rely on food brokers to market the product. In either case, the cost of market entry will be substantial. Retail firms are often reluctant to stock new brands because of display and storage space restrictions. Adding a new brand of a particular product usually means dropping or reducing the shelf space of other brands. Retail firms need an economic incentive to change.

OPERATING MODEL FOR NEW PROCESSING COOPERATIVES

A new processing cooperative organization would need a sound operating structure. For comparison, California Cannery and Growers (CCG) Cooperative¹ would be a good operating model for fruit and vegetable processing cooperatives in the South and Southeast States.

CCG began operating in 1958 by purchasing several canning companies. They functioned as subsidiaries, each retaining its own management and board of directors and each reporting to the parent board of directors. This arrangement provided growers with qualified management and an efficient operation for the first 5 years. In 1964, all divisions and subsidiaries were merged into a single operating company. A management group was selected from the previous operating staff. The merger included consolidating the cooperative's five former independent food processing firms, their nine modern canning plants, and all administrative, marketing, and accounting personnel. San Francisco was chosen for the new headquarters because of its accessibility to the growing area, canneries, food buyers, sales outlets, and financial institutions.

Here is how that cooperative applied cooperative principles, to membership, voting, crop purchase, membership agreements, and financing in developing a successful processing operation.

Eligibility for Membership—Any producer whose agricultural products could be processed, marketed, or handled by the association was eligible for membership. The applicant had to agree with the association's marketing requirements and the long-range projection of raw product needs by

¹ California Cannery and Growers Cooperative started operations on a sound cooperative basis. In subsequent years, it suffered financial reversals and was forced to sell assets. Key ones were purchased by Tri Valley Cooperative. While the former cooperative is no longer operating, it still serves as an example of how producers can pool their resources to provide services and markets for themselves and improve their economic well-being.

commodity, variety, and crop location. The applicant was then screened to determine his/her financial stability, the quality of fruits or vegetables to be produced, and overall production capabilities.

Growers—members had to sign a 3-year membership agreement and agree to leave a portion of net proceeds from each year's crop production in the cooperative as working capital. Although waiting lists were common to all commodities, membership was periodically open when raw-product needs occurred.

Voting—Members were entitled to one vote for every \$5,000 worth of business (raw-product value), with a minimum of one vote per member.

Crop Purchase and Membership Agreement—The member agreed to sell and deliver all products produced or furnished by him/her. The cooperative, in turn, agreed to purchase and receive those products.

The member agreed to conform to the rules and regulations of the cooperative and accept its grading standards and established classifications. While agreement terms were for 15 years, a termination clause could be exercised by the member at the end of the third year, or any anniversary date thereafter. The cooperative could exercise its option on any anniversary date by giving a 1-year advance notice.

Financing—The financial structure of a new cooperative can take many forms. CCG was organized without capital stock. Initial capital of about \$1 million was obtained through growers' investment in equity certificates. Individual grower investment represented about 15 percent of the 1957 per-ton value for each commodity in a given area.

In 1962, the investment requirement for new members was eliminated and necessary financing obtained through retains from the total net returns of the association. At the end of each fiscal year, 80 percent of net returns were retained in a revolving fund. Both capital contribution and capital retains were revolved at the discretion of the board of directors.

While the California cooperative is a good model, new cooperatives need to adapt these principles to their individual operations.

Barriers to Development

Despite several advantages, there are economic and institutional barriers to the increased production of fruits and vegetables for processing in the South and Southeast. These problems include the relatively small farm conflicts with existing profitable enterprise alternatives (particularly, livestock, corn, soybeans, cotton, tobacco, peanuts, and wheat), farmer attitudes toward technological change, unorganized markets, and the high cost of market entry. Small farms are usually not economically feasible because they can't use mechanical production and harvesting methods.

A main problem is securing a constant supply and consistent-quality fruit and vegetable products needed to operate cooperative processing facilities. This is important, because row crops often compete with fruit and vegetable production in a farm operation. When livestock and row crop prices improve, many producers may consider these enterprises more profitable than fruits and vegetables.

Another barrier is a relatively wide price differential between fresh and processing market outlets. Because most vegetables may be marketed in either fresh or processing outlets, producers respond to the more attractive alternatives. In general, fresh market produce prices exceed those from processing.

However, caution must be exercised in interpreting the implication of these price differentials. The fresh market is subject to market price variability and markets change as the season progresses. For example, prices paid in the fresh market in the first 2 weeks of harvesting season may be favorable for producers, but may quickly drop to the processing price level for the remainder of the season due to market saturation.

Benefits of Processing Cooperatives

Starting a fruit and vegetable processing cooperative is a major project accompanied by considerable risk. Today, many of the South and Southeast fruit and vegetable farms are small. Success has not been easy even through a cooperative, where farm-

ers are able to generate sufficient volume of business to support a processing plant, improve bargaining power and competitive position relative to other businesses.

However, despite the risk and barriers, some producer groups have successfully organized and operated fruit and vegetable processing cooperatives. An example is Tree Top, Inc., an apple processing cooperative, formed in 1960 in Selah, WA.

Tree Top is owned by 3,500 apple and pear growers in Washington, Oregon, and Idaho. The cooperative was formed to process and market its members' processed-grade fruit. About 20 percent of the members' production was not suitable for sale in the fresh market.

Currently, Tree Top operates four processing plants in Washington plus a bottling and packing facility in southern California. The cooperative has also contracted with other food firms to blend and package Tree Top products under its specifications and direction for distribution to distant markets.

Tree Top sales have grown from \$1.7 million in 1960 to nearly \$250 million today. It employs more than 1,200 people. Tree Top has become the Nation's top apple processing and marketing firm.

A fruit and vegetable processing cooperative can provide many benefits and services to producer-members, such as coordinating production and marketing activities. This coordination could assure greater stability to the industry as a whole and fairer returns to the producer owners from fresh and processed sales. Other benefits are lower sales and promotion costs, adequate financing by pooling resources, higher sales value of total production, improved standardization of products and packs, and reduced transportation and distribution costs.

Fruit and vegetable processing cooperative members also can benefit from value added to the raw product through processing. Because the producers own the processing operation, they participate in any net savings (profits) of the cooperative. Producer members build up equity in their own business and at the same time increase farm income.

Alternative Processing Operation

The study has focused on opportunities for traditional fruit and vegetable cooperative processing operations. This section examines an alternative processing operation known as fresh-cut, fresh pre-cut, fresh processed, or value-added. This type of processing operation could offer opportunities for southern fruit and vegetable producers to develop and expand processing cooperatives, and market outlets for their products.

USDA defines fresh-cut produce as "any fresh fruit, vegetable, or combination thereof that has been physically altered from its original form, but remains in a fresh state (e.g., sliced melon, shredded cabbage, salad mix, etc.)."

The future appears favorable for fresh-cut products in the U.S. Industry experts believe that pre-cut produce will be one of the most rapidly growing areas in the retail produce department in coming years. Time and lifestyle pressures on consumers will prompt demand for convenience in food products.

Families in which both parents work will have neither the time, nor energy, to prepare every meal from scratch. They will be looking for nutritious and convenient food products. The emergence and growth of the pre-cut industry indicates that both fresh produce processors and retailers are actively working to fill this market.

Opportunities for new firms in the fresh processed markets are emerging. Early pre-cut processors started out as simple backroom operations. But, competition, increased demand, and tighter handling and sanitation regulations have made those operations largely obsolete.

Initially, retailers (supermarkets) looked to get an edge on freshness by doing the cutting on store premises. However, they quickly realized that these operations required considerable space for an efficient processing department. These operations are also capital and labor intensive, so many retailers are now securing their fresh pre-cut products from outside sellers.

Niche Market New firms and producer groups entering the pre-cut markets face many of the same

problems associated with traditional processing markets: marketing the product, securing raw produce, and technology and food safety.

One approach in this new environment is to identify a niche based on the type of product and market served. Potential market outlets include foodservice, institutional, restaurant, wholesale, and retail operations.

Potential markets can be divided into two broad categories, commercial and noncommercial. Within each are many different types of operations and marketing systems, with specific wants and needs. Commercial markets include fast food restaurants, sit down restaurants, clubs, hotels, caterers, airlines, and cruise ships.

The noncommercial segment includes educational and health care institutions, prisons, and the military. Each area has unique needs in terms of the types and quantities of produce items they can use. Consequently, this market segment presents a wide range of opportunities for produce suppliers.

There are many markets for fresh pre-cut produce. Successful operations have matched their strengths with the needs of a particular market. For example, one company cuts slaw, salad, fruits, and vegetables for local retailers and food manufacturers. Another company found a niche in a local deli market and sells more than 200 cut items. A product that sells well in one market may not move in others.

Many produce experts think that the foodservice industry is the ideal place for fresh pre-cut produce because the product offers less waste and greater consistency and convenience. However, institutional customers are inclined to buy pre-cut produce items because they save time, labor, and money. Further, firms are also facing escalating wage rates and a limited labor supply. Pre-cut produce allows better control over costs because buyers can easily calculate and monitor their costs for each unit served.

The foodservice industry uses an estimated 70 percent of all pre-cut fresh-processed produce. That rate represents only 10 to 12 percent of their total produce purchases. However, based on the industry's figures, that level is expected to reach 40 percent in about 8 years.

Table 20—Selected vegetables for fresh processing operation 1992 ¹

Type of Vegetables	
Beets	Celery
Broccoli	Green Peppers
Cabbage	Potatoes
Carrots	Radishes
Cauliflower	Squash

¹ Based on volume sold.

Fresh Pre-cut Markets Growers in the study area are strategically located to provide produce for a fresh pre-cut processing operation. The area has a substantial population base and supports many foodservice, institutional, restaurant, and retail operations. Table 20 shows 10 major vegetable crops used in fresh pre-cut processing operations. Most of these vegetable crops are grown in large volume in the South.

However, since consistency and convenience are the main selling points for fresh pre-cut products, a new processor may need to look outside the production area during the off-season for raw products to maintain year-round service.

This can be accomplished by creating a new cooperative venture to link growers or cooperatives in other regions, where quality produce is available when locally grown product is not. For example, produce may be sources from year-round production regions such as Florida, California, Mexico, or the Caribbean. Such joint ventures or strategic alliances with other producers will enable the new cooperative to service its markets and provide a large volume of high quality products year-round.

Problem Areas While the fresh pre-cut processed products are getting good reviews, there are a series of questions and problems facing the industry. Foremost is technology.

Technology Lack of adequate refrigeration and cutting equipment is delaying development and expansion of the fresh pre-cut market. Some

industry experts feel this produce won't reach its full potential until adequate refrigeration is in place, both in transportation and at retail outlets. Even under the best conditions, the shelf life of pre-cut produce is relatively short, often limited to 2 or 3 days.

Several small machinery suppliers are currently researching refrigeration and cutting equipment to improve the quality and shelf life of fresh pre-cut products. One new unit delivers product to cutters using belts and centering devices instead of water. The new equipment helps cut down on water use in processing and permits efficiencies in cutting.

Equipment also is being developed that handles product more gently and is tailored to individual commodity characteristics. Also, new cutting methods also are being researched by pre-cut equipment suppliers.

Packaging poses another hurdle. Recent advances have been made in packaging technology, such as a "smart" membrane-like wrapping developed by a Delaware chemical and aerospace firm. The membrane regulates the inner atmosphere surrounding the vegetable or fruit and slows the plant's respiration process and its eventual decay.

An industry representative indicated that "a company that prepares and sells fresh pre-cut fruits and vegetables must have attractive, high-quality, and conveniently-packed produce, offer an easy-to-open package, have a long shelf life, be available consistently, and at the right price." It's important to get these products to consumers in less than 24 hours from the time they are prepared. The temperature must be controlled throughout the distribution channel.

Food Safety and Sanitation Food safety and sanitary conditions are a major concern to the consumer, retailer, and produce processor. Currently, there are no regulations or guidelines governing the fresh-cut produce industry. However, processors and retailers are cognizant of the need for research and developing a better understanding of the potential food safety problems associated with improperly handled produce.

Although fresh-cut produce poses less of a food safety hazard than meat or dairy products, it

is still a raw product and subject to microbial growth and decay. The number of instances of food-borne illness associated with fresh-cut produce is small, but even one occurrence can devastate the industry.

Marketing an attractive, safe, and sanitary product begins with the quality of produce being processed. Attempting to process old or poor quality produce will result in an inferior final product. Consequently, processors must be certain that only the freshest product is used in their operation.

Further, the processor must closely monitor the sanitary conditions of the fresh-cut operation. A product improperly packaged, cooled, or handled will likely have a shorter shelf-life and directly effect the quality of the product purchased by the consumer. A dissatisfied customer is not likely to make a repeat purchase.

In addition to making certain that the produce is thoroughly cleaned and cooled, the processor must also monitor the produce for pesticide, fertilizer, or other chemical residue. Many potential food safety concerns can be minimized by maintaining a clean facility and equipment, educating food handlers about proper sanitary practices, and providing adequate cooling for the produce.

The responsibility for safe and sanitary treatment of produce does not rest solely with the processor. The retailer must also take responsibility, through proper handling and care, to ensure that only quality fresh-cut produce is being offered to the consumer.

Currently, several industry groups are developing guidelines concerning the proper care and handling of fresh pre-cut products. These efforts are intended to give industry personnel a set of standard practices for the safe and profitable marketing of fresh-cut produce. As this infant industry evolves, continued research and education efforts will minimize potential food safety problems and allow participants to capitalize on these market opportunities.

Benefits of Fresh Pre-cut Products

As long as consumers continue to demand convenient and healthy at-home meals, the pre-cut

produce market will continue to grow. The product saves the consumer time in meal preparation and allows retail managers to incorporate the product into a variety of merchandising schemes.

Fresh pre-cut produce has generated a 60-70 percent gross margin for some supermarket chains. New customers, intrigued by such visible benefits as convenience and freshness, are being drawn to stores offering a good pre-cut selection. The number of processors and product variety will increase as advances in technology continue to improve the quality.

The market is still in its infancy. Many consumers are unaware of the number of pre-cut items now available in the supermarket. Pre-cut can be an instrument in increasing overall produce consumption. If wholesalers and retailers provide consumers with alternatives to easily incorporate more fresh vegetables into their diets, they will buy them. Also, consumption is expected to increase as the produce industry and others continue to promote the 5-a-day program and the merits of eating fresh produce. People are looking for convenient, ready-to-eat produce, and pre-cut products may meet their needs.

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

This report gives a general overview of the fruit and vegetable processing industry in the U.S. with special emphasis on investigating the potential for developing and expanding fruit and vegetable processing cooperatives in 13 States in the South and Southeast.

Based on the analysis of data and informal interviews with agricultural and rural development specialists, it appears that the development and operations of traditional fruit and vegetable processing cooperatives will not be a feasible venture at this time.

Overall, the U.S. fruit and vegetable processing industry has experienced one of the highest growth rates in the food processing industry over the last 20 years. Much of that results from new technologies aimed at convenience, cost reduction, and quality control. Simultaneously, the per-capita

consumption of fruits and vegetables increased modestly. The production of fruits and vegetables (acreage and tonnage) has been relatively stable.

In contrast, the study area doesn't enjoy the same level of success as the U.S. in general, although the area has abundant productive land and ample water for irrigation to support commercial fruit and vegetable production. There is a sufficient volume of raw products, such as snap beans, sweet corn, cucumbers, green peas, and tomatoes, being produced to help support existing processors.

However, there has been a decline in the number of farms and harvested acres of major fruits and vegetables. In addition, the number of existing processing plants has declined, largely due to the lack of an adequate source of raw products.

A fresh pre-cut processing cooperative operation could offer opportunities for fruit and vegetable producers in this area. Such an operation would require a smaller volume of products and would be less capital intensive compared with a traditional processing operation. However, there is strong competition, and only top quality pre-cut produce processed under the strictest sanitary guidelines can find its way to large foodservice and retail customers.

The success of a new processing cooperative will be determined by its ability to market its products. While other groups have had success in developing and operating processing cooperatives, new cooperative ventures should not assume that unlimited quantities of processed commodities can be sold at prevailing market prices.

Producers interested in forming a processing cooperative have several options to consider. The decision to process and pack for themselves or an independent food firm will depend on the particular strengths and weaknesses characterizing the cooperative members. The ability to produce, process, market, and finance an operation will all be factors to consider and likely pose unique problems and opportunities.

Despite the fact that the area has abundant natural and human resources, economic and institutional barriers may limit increased production of fruit and vegetables for processing.

These barrier include the relatively small farm size, competition with existing profitable enterprises (particularly livestock, corn, soybeans, cotton, tobacco, peanuts, and wheat), farmer attitudes toward technological change, unorganized markets, and the high cost of market entry. Therefore, based on the above barriers and production trends of fruits and vegetables in recent years, the potential for developing and successfully operating new fruit and vegetable processing cooperatives in the study area appears to be limited and risky.

However, the development of a fruit and vegetable cooperative processing operation would add value to the product, creating additional market outlets, increasing farm income, and providing opportunities for economic development in rural communities. Therefore, State and county agricultural leaders are encouraged to work with producers in the 13 States to determine their interest in producing fruits and vegetables and supporting a cooperative processing operation.

If producers express strong support for processing cooperatives, both through their patronage (raw products) and their finance, a feasibility study should be conducted to determine the type and size of operation. There are several potential options for a group to consider, given the economic and general characteristics of the area:

1. Develop a fresh processing pre-cut fruit and vegetable operation for a niche market.

2. Develop or expand existing fresh fruit and vegetable marketing cooperatives and incorporate a fresh pre-cut operation. Develop linkages with existing cooperative processors or noncooperative processors in the area to market excess fresh and cull produce.

3. Pack fresh pre-cut for an established processor under a contract which specifies labels, price, package size, quantity, and quality standards.

4. Pack fresh pre-cut for a retail food or distributor under a contract that specifies conditions similar to a contract with another processor.

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