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MARKETING TEMPERATE CROP FRUITS & VEGETABLES  
IN GUATEMALA, C.A.  
MARKET ANALYSIS

by

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Guatemala Small Farmer Marketing Project  
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# GUATEMALA SMALL FARMER FRUIT & VEGETABLE MARKETING

## MARKET ANALYSIS

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When gathering information which may be used in making decisions on improving a marketing system, ultimately recommendations must center upon making changes in the present system. These changes may relate to providing more and better market information, reorganizing the present structure, improving market performance of those in the present system, improving storage and transportation, improving price efficiency of the system, reducing shrink wherever loss is excessive, improving quality maintenance throughout the system, and developing more efficient physical facilities where they are needed.

Recommendations for change should take into account agricultural products produced, seasonality of production, need for storage for less perishable crops, relative profitability of crops produced, transportation inefficiencies, pricing inefficiencies, marketing losses, equity questions for producers, those in the marketing system and consumers as well as quality improvement, meeting needs of export market, cultural and social patterns which can have major effects on production, marketing and consumption of food in Guatemala.

All of these influences come to bear upon alternatives related to establishing new market facilities. This report will concentrate on preliminary information needed to evaluate questions about location, size and function of new market facilities which have potential for increasing the income of small farmers in the highlands area of Guatemala.

Observations by myself, Steele, Jelinick, Godwin and in-country marketing people (see Appendix for summaries of observations) have indicated inefficiencies in assembling fresh fruit and vegetable crops from the point of production to the centers of population where the distribution function begins. These inefficiencies are related to product handling, and to total time committed by producers and sub-assemblers (truckers and village markets) to market small quantities. There is also some indications of pricing inefficiencies which lead to wide price variations over short time spans for some of the fruit and vegetable crops. Two areas, then, seem to appear as prime subjects for further investigation:

- (1) The location and size of market facilities for crops for which there is a volume of production.
- (2) The improvement of market information to farmers, including price, quantities, and quality characteristics.

These two areas of concern can be integrated into one marketing approach.

The procedure for analyzing the marketing of the identified fruits and vegetables from the highlands of Guatemala follows:

## Market Analysis

1. Identify crops (fruits and vegetables) which are of some importance or which have potential for increasing farmers' income .
2. Locate major production areas for these fruits and vegetables .
3. Identify value of crop and tonnage of crops in major production areas .
4. Identify the major production areas and the major consumption areas where tonnage appears to have a potential volume sufficient for considering a sub-assembly point or some other market facility .
5. Choose the crops in each major production marketing area that have potential for improving the market performance of that commodity through assembly, grading, transportation, storage, packaging or pricing activities of a market facility .
6. Estimate the market share that is feasible of the total marketings from an area of the crops identified .
7. Determine the size of each facility needed and the equipment needed to fulfill the marketing functions identified with each crop to be handled .
8. Identify and analyze capital requirements and operating costs for market facilities and services identified .
9. Determine benefits and revenues accruing to and because of added market facilities and services .

10. Recommend action based on capital requirements and operating costs compared with benefits and revenues derived.
11. If recommended action is for developing market facilities, choose the site or sites for the facilities.
12. Develop detailed plans for organization of farmers and market operations.

#### Crops to be Considered

Crops which are considered for inclusion in the Small Farmers Fruit and Vegetable Marketing Project are identified in Table 1. The consideration of marketing facilities for some 20 fruits and nine vegetables is rather complex and perhaps even hazardous. Typically, an assembly point specializes in a very limited number of crops. This is because of varying requirements of each crop in handling procedures, in perishability characteristics, in packaging, and transportation requirements and in storage temperature and humidity optimums.

A strong recommendation, therefore, would be to select those crops which are marketed in sufficient volume to achieve efficiencies in marketing and which have at least some common transportation, perishability and storage characteristics that would permit common use of a marketing facility.

Incomplete and preliminary information about the 20 vegetable and fruit crops is contained in Table 2. This information is derived from production cost estimates and market prices of Dr. Leonel Gonzales, Ivan Garcia, and Dr. Howard Steele.

Table 1

**GUATEMALA SMALL FARMER MARKETING IMPROVEMENT  
PROJECT - 1976**

**List of Temperate Fruits and Vegetables of Interest**

**A. FRUITS**

	<u>FRUITAS</u>
1. Apple	1. Manzana
2. Avocado	2. Aguacate
3. Blackberry	3. Zarsamora or Mora
4. Peach	4. Durazno or Melocotón
5. Pear	5. Pera
6. Plum	6. Ciruela
7. Quince	7. Membrillo
8. Raspberry	8. Frambuesa
9. Strawberry	9. Fresa

<u>VEGETABLES</u>	<u>HORTALIZAS</u>	<u>VEGETABLES</u>	<u>HORTALIZAS</u>
1. Asparagus	1. Espárrago	11. Garlic	11. Ajo
2. Beet	2. Remolacha	12. Green Bean	12. Ejote
3. Broccoli	3. Brocoli o Brecol	13. Lettuce	13. Lechuga
4. Brussel Sprouts	4. Bretones	14. Onion	14. Cebolla
5. Cabbage	5. Repollo	15. Peas	15. Arveja
6. Carrot	6. Zanahoria	16. Potato	16. Papa
7. Cauliflower	7. Coliflor	17. Radish	17. Rábano
8. Celery	8. Apio	18. Spinach	18. Espinaca
9. Chard	9. Acelga	19. Tomato	19. Tomate
10. Cucumber	10. Pepino	20. Turnip	20. Nabo

Table 2. Preliminary Estimates of Guatemala Highland Vegetable/Fruit Production, 1975

	MT	Yield Per hectare	hectares	Farm Net \$ Per Hectare	Total Net Income
1. Potatoes	17,000	13.0	1,308	550	\$ 719,400
2. Carrots	15,874	20.0	794	709	562,946
3. Cabbage	15,500	21.2	731	296	216,376
4. Cauliflower	14,000	15.5	903	976	881,328
5. Chard	9,018	13.9	649	835	541,915
6. Beets	5,671	17.1	332	933	309,756
7. Onions	5,500	20.0	275	677	186,175
8. Lettuce	5,350	16.46	325	753	244,725
9. Garlic	5,278	6.3	837	715	598,455
10. Green Beans	5,184	10.0	518	184	95,912
11. Radishes	4,787	6.6	725	463	-----
12. Tomatoes	4,200	28.0	150	525	78,750
13. Peas	2,333	4.2	555	204	113,220
14. Cucumbers	2,100	8.5	247	646	159,562
15. Turnips	1,764	10.0	176	494	86,944
16. Spinach	1,512	10.0	151	835	126,085
17. Celery	837	11.0	76	876	66,576
18. Brussels Sprouts	54	13.5	4	144	576
19. Broccoli	19	16.0	1	908	908
20. Asparagus	15	2.2	7		
21. Plums	890	8.0	111		
22. Peaches	1,083	20.0	54		
23. Berries	106	13.0	9		
24. Apples	2,253	18.0	125		
25. Pears	629	18.0	35		
26. Avocados	20,000	18.0	1,111		

### Location of Population

Before proceeding to disaggregate production data, some estimate of where the consuming population lives in the country should be explored. Table 3 identifies the population of Guatemala by Departments and Municipios. Details include the size of the geographical area, the urban population, the rural population, and the population density as measured by population per square kilometer. Seven departments have a population density of about 100 persons per square kilometer or more. These seven departments account for 46 percent of the total population and should be considered as locations for any market facility which is developed to better service the consumer, should such a market facility be needed to improve total market performance.

If market facilities to better serve the consumer do appear feasible as a means of increasing small farmers' income, then a much more thorough analysis of this final step in marketing food needs to be made.

### Value of Production of Fruit & Vegetable Crops

Information in Table 4 gives preliminary estimates of the hectarage and yield per hectare in the highlands area that can realistically be achieved by small farmers. Prices per metric ton are averages that farmers receive over the marketing season. Total production in metric tons is for the entire country. The farm gross income per hectare in dollars or Quetzales (\$1 = Q1)



Table 3. Guatemala 1973 Population

Department y Municipio	Km <sup>2</sup>	Urban	Rural	Total	Habitantes Per Km <sup>2</sup>
La Republic	108,889	1,752,495	3,459,434	5,211,929	48
Guatemala	2,126	799,271	328,574	1,127,845	530
El Progreso	1,922	16,700	56,476	73,176	38
Sacatepequez	465	71,556	28,154	99,710	214
Chimaltenango	1,979	67,288	126,269	193,557	98
Escuintla	4,384	93,022	207,118	300,140	68
Santa Rosa	2,955	38,453	137,745	176,198	60
Solola	1,061	40,914	85,970	126,884	120
Totonicapan	1,061	24,820	141,802	166,622	157
Quezaltenango	1,951	108,750	202,863	311,613	160
Suchitepequez	2,510	64,098	147,919	212,017	84
Retalhuleu	1,856	38,831	95,162	133,993	51
San Marcos	3,791	49,553	338,547	388,100	102
Huchuetenango	7,400	58,167	310,640	368,807	50
Quiche	8,378	30,835	269,806	300,641	36
Baja Verapaz	3,124	22,687	84,222	106,909	34
Alta Verapaz	8,686	34,740	241,630	276,370	32
Peten	35,854	20,448	44,055	64,503	2
Izabel	9,038	29,566	141,298	170,864	19
Zacapa	2,690	30,551	76,175	106,726	40
Chichimula	2,376	35,833	122,313	158,146	67
Jalapa	2,063	32,673	85,430	118,103	57
Jutiapa	3,219	43,739	187,266	231,005	72

Table 4. Estimated Production & Value of Temperate Fruit & Vegetable Crops in Guatemala - 1975

Crop	Hectares	Yield MT/H	Price MT	Total MT	Farm Gross Per Hectare	Farm Net Per Hectare	Total Farm Value
Tomatoes	3,039	28.0	\$ 75	85,080	\$ 2,100	\$ 526	\$ 6,382,000
Onions	1,189	14.0	150	16,630	2,100	677	2,497,000
Cabbage	1,103	21.2	83	23,394	1,766	296	1,948,000
Potatoes	1,953	13.0	130	25,394	1,690	515	3,361,000
Carrots	794	20.0	167	15,874	3,474	709	2,758,000
Garlic	838	6.3	445	5,278	2,804	715	2,349,000
Beets	332	17.1	227	5,671	3,880	682	1,288,000
Radishes	725	6.6	336	4,787	2,215	463	1,606,000
Turnips	176	10.0	167	1,764	2,200	494	388,000
Celery	76	11.0	335	837	3,685	876	280,000
Chard	649	13.9	300	9,018	4,170	835	2,706,000
Cucumbers	647	8.5	212	5,500	1,802	646	1,117,000
Green Beans	518	10.0	250	5,184	725	184	375,000
Cauliflower	903	15.5	160	14,000	2,480	976	2,239,000
Lettuce	324	16.5	182	5,350	3,000	733	972,000
Spinach	151	10.0	230	1,512	2,300	835	347,000
Peas	555	4.2	235	2,333	987	204	548,000
*Asparagus							
Broccoli	7.3	12.0	513	88	1,517	662	45,000
Brussels Sprouts							
**Plums	111	8.0		888	2,730		303,000
Peaches	54	20.0		1,080	4,000		216,000
Berries	9	13.0		117	3,000		41,000
Apples	125	18.0		2,250	4,000		500,000
Pears	35	18.0		630	4,000		140,000
Avocados	1,111	18.0		19,998	3,000		3,000,000

\* Understated

\*\* All Fruit Information Is Tentative

is followed by the farmers' net income per hectare as developed in enterprise budget sheets developed by Dr. Leonel Gonzales for this project. Finally, an estimate of the total farm value of each crop is presented in the last column.

#### Location of Production

Table 5 contains information that allocates production of the temperate fruit and vegetable crops under consideration by geographical areas in percentage of the total crop. This information has then been recombined into possible market areas to examine the tonnage and value of these crops by market areas.

For the first trial of identifying areas that could be considered as possible sites for a market facility (sub-assembly, grading, packaging, shipping point or distribution point) four geographical market areas were selected:

- (1) The Huehuetenango market area
- (2) The San Marcos, Quezaltenango, Totonicpan market area
- (3) The Tecpan, Solola, Quiche market area
- (4) The Guatemala market area, including Sacatepequez

Tables 6 through 9 provide estimates of crops produced in each of these areas with the tonnage produced and farm value of that production. Also indicated is the share of the total production in the country that is produced in each of these market areas.

Table 5. Temperate Crop Production --Guatemala--1975--Preliminary Estimate of Production by Geographical Areas--Percent of Total Crop \*

	Chimaltenango		Guatemala						Sacatepequez	Huehuetenango		Quezaltenango			San Marcos	Solola	Totonicapan	Quiche	Rest of Country
	Tecpan	Comalapa	San Jose Pinulia	Amatilan	Palencia	Villanueva	Barceras	Villa Canallas		Chiantla	Aquacatan	Almolonga	Zunil	Cantel					
Tomatoes	1.0	1.0	3.0	2.0	3.0	2.0	2.0	2.0	---	.1	.1	---	---	---	.1	---	---	.2	83.7
Onions	2.0	2.0	1.7	1.7	1.7	1.7	1.7	1.7	4.0	2.5	3.0	12.0	12.0	---	---	4.5	---	.5	49.0
Cabbage	8.0	8.0	1.3	1.3	1.3	1.3	1.3	1.3	16.0	---	---	6.0	6.0	---	36.0	12.0	---	---	---
Potatoes	4.0	4.0	1.7	1.7	1.7	1.7	1.7	1.7	3.0	4.0	4.0	4.0	4.0	---	20.0	4.0	2.0	.8	13.0
Carrots	15.0	15.0	1.7	1.7	1.7	1.7	1.7	1.7	10.0	5.0	4.0	5.0	5.0	---	22.0	8.0	1.0	---	---
Garlic	5.0	5.0	4.0	1.2	1.2	1.2	1.2	1.2	---	30.0	40.0	1.0	4.0	---	---	5.0	---	---	---
Beets	13.0	12.0	1.7	1.7	1.7	1.7	1.7	---	25.0	---	---	10.0	8.0	---	7.0	15.0	---	---	---
Radishes	10.0	10.0	5.0	4.0	4.0	3.0	2.0	2.0	20.0	---	---	7.0	6.0	---	23.0	4.0	---	---	---
Turnips	18.0	17.0	1.7	1.7	1.7	1.7	1.7	1.7	35.0	---	---	---	---	---	20.0	---	---	---	---
Celery	17.0	16.0	---	---	---	---	---	---	33.0	---	20.0	14.0	---	---	---	---	---	---	---
Chard	10.0	10.0	---	---	---	---	---	---	40.0	---	---	25.0	14.0	---	---	---	---	---	---
Cucumbers	---	---	3.0	3.0	3.0	2.0	2.0	2.0	---	---	---	---	---	---	---	---	---	---	85.0
Green Beans	10.0	10.0	4.0	4.0	3.0	3.0	3.0	3.0	20.0	---	---	10.0	10.0	---	---	20.0	---	---	---
Cauliflower	15.0	15.0	---	---	---	---	---	---	30.0	---	---	5.0	5.0	---	30.0	---	---	---	---
Lettuce	5.0	5.0	4.0	4.0	3.0	3.0	3.0	3.0	40.0	---	---	15.0	15.0	---	---	---	---	---	---
Spinach	5.0	5.0	---	---	---	---	---	---	30.0	---	---	15.0	15.0	---	---	30.0	---	---	---
Peas	23.0	22.0	1.7	1.7	1.7	1.7	1.7	1.7	35.0	---	---	3.0	2.0	---	15.0	---	---	---	---
Asparagus	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Broccoli	10.0	10.0	4.0	4.0	3.0	3.0	3.0	3.0	20.0	---	---	10.0	10.0	---	---	20.0	---	---	---
Brussels Sprouts	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Plums	31.4	---	---	---	9.0	---	---	---	8.9	.1	---	23.6	---	.7	2.6	2.0	---	---	21.8
Peaches	14.0	---	---	---	4.0	---	---	---	25.0	1.0	---	8.0	---	32.0	4.0	1.0	---	---	11.0
Berries	15.0	---	---	---	20.0	---	---	---	15.0	10.0	---	15.0	---	---	---	---	---	---	---
Apples	7.9	---	---	---	.6	---	---	---	6.6	3.2	---	53.4	---	6.6	.5	3.6	---	---	17.6
Pears	11.9	---	---	---	2.1	---	---	---	72.1	.04	---	3.2	---	.1	1.0	.8	---	---	8.8
Avocadoes	25.0	---	---	---	8.0	---	---	---	25.0	---	---	---	---	---	9.0	6.0	---	---	27.0

\*This information developed by Ivan Garcia from INDECA sources.

Table 6. Annual Tonnage, Farm Value and Percentage of National Production Identified with the Huehuetenango Market Area No. 1

Crop	Area of Concentration	Metric Tons	Value	Percent of Total Production
Tomatoes	Dispersed	425	\$ 31,910	*
Onions	Dispersed	750	112,360	4.5
Potatoes	Huehuetenango	5,078	660,114	20.0
Carrots	Huehuetenango	1,487	248,252	9.0
Garlic	Huehuetenango	3,696	1,644,826	70.0
Chard	Huehuetenango	24	7,050	*
Plums		6	3,030	*
Peaches		11	2,160	1.0
Berries		12	2,700	10.0
Apples		72	16,000	3.2
Pears		5	5,600	*
Total		11,566	\$2,733,103	

\*Less than 1 percent of total production.

Table 7. Annual Tonnage, Farm Value and Percentage of National Production Identified with the San Marcos, Quezaltenango, Totonicapan Market Area No. 2

Crop	Area of Concentration	Metric Tons	Value	Percent of Total Production
Tomatoes	Dispersed	85	\$ 6,381	*
Onions	Almolonga, Zunil	3,991	599,256	24
Cabbage	San Marcos, Almolonga, Zunil	11,229	934,991	48
Potatoes	San Marcos, Almolonga, Zunil	10,394	1,386,239	42
Carrots	San Marcos, Almolonga, Zunil	5,238	910,257	33
Garlic	Dispersed and Zunil	264	117,487	5
Beets	Almolonga, San Marcos, Zunil	1,418	322,040	25
Radishes	Almolonga, Zunil	622	208,763	13
Celery	Almolonga, Zunil	285	95,220	34
Chard	Almolonga, Zunil	3,607	1,082,532	40
Green Beans	San Marcos, Almolonga, Zunil	1,036	75,110	20
Cauliflower	San Marcos, Almolonga, Zunil	5,600	895,776	40
Lettuce	Almolonga, Zunil	1,605	291,600	30
Spinach	Almolonga, Zunil	454	104,190	30
Peas	San Marcos, Almolonga, Zunil	467	109,557	20
Asparagus				
Broccoli	Almolonga, Zunil	18	9,015	20
Brussels Sprouts				
Plums		231	79,689	26
Peaches		443	88,560	41
Berries		18	4,050	15
Apples		1,440	318,000	64
Pears		32	7,140	5
Avocados		<u>1,000</u>	<u>166,650</u>	5
Total		49,477	\$ 7,813,103	

\*Less than 1 percent of total production.

Table 8. Annual Tonnage, Value and Percentage of National Production Identified with the Tecpan, Solola and Quiche Market Area No. 3

Crop	Area of Concentration	Metric Tons	Value	Percent of Total Production
Tomatoes	Dispersed	1,702	\$ 127,638	2
Onions	Tecpan, Comalapa, Solola	1,497	224,721	9
Cabbage	Tecpan, Comalapa, Solola	6,550	554,441	28
Potatoes	Tecpan, Comalapa, Solola	3,301	990,171	13
Carrots	Tecpan, Comalapa, Solola	6,032	1,048,175	38
Garlic	Tecpan, Comalapa, Solola	791	352,463	15
Beets	Tecpan, Comalapa, Solola	2,268	515,263	40
Radishes	Tecpan, Comalapa, Solola	1,149	385,410	24
Turnips	Tecpan, Comalapa, Solola	970	213,546	55
Celery	Tecpan, Comalapa	276	92,420	33
Chard	Tecpan, Comalapa	1,803	514,266	20
Green Beans	Tecpan, Comalapa, Solola	2,073	150,550	40
Cauliflower	Tecpan, Comalapa	4,200	671,832	30
Lettuce	Tecpan, Comalapa	535	97,200	10
Spinach	Solola, Tecpan, Comalapa	605	138,920	40
Peas	Tecpan, Comalapa	817	191,724	35
Asparagus				
Broccoli	Solola, Tecpan, Comalapa	35	4,429	40
Brussels Sprouts				
Plums		80	26,058	9
Peaches		76	15,120	7
Berries		33	7,560	28
Apples		45	12,000	2
Pears		19	4,000	3
Avocados		<u>3,000</u>	<u>499,950</u>	15
Total		35,809	\$ 6,830,457	

Table 9. Annual Tonnage, Value, and Percentage of National Production Identified with the Guatemala Market Area No. 4

Crop	Area of Concentration	Metric Tons	Value	Percent of Total Production
Tomatoes	Dispersed	11,911	\$ 893,466	14
Onions	Sacatepequez, Dispersed	2,328	349,566	14
Cabbage	Sacatepequez, Dispersed	5,614	467,496	24
Potatoes	Dispersed	3,301	429,074	13
Carrots	Sacatepequez, Dispersed	3,174	551,167	20
Garlic	Dispersed	528	234,975	10
Beets	Sacatepequez, Dispersed	1,985	450,856	35
Radishes	Sacatepequez, Dispersed	1,915	642,350	40
Turnips	Sacatepequez, Dispersed	794	174,179	45
Celery	Sacatepequez	276	92,420	33
Chard	Sacatepequez	3,607	1,082,532	40
Cucumbers	Dispersed	825	167,534	15
Green Beans	Sacatepequez, Dispersed	2,074	150,220	40
Cauliflower	Sacatepequez	4,200	671,832	30
Lettuce	Sacatepequez, Dispersed	3,210	583,200	60
Spinach	Sacatepequez	454	104,300	30
Peas	Sacatepequez, Dispersed	1,050	246,503	45
Asparagus				
Broccoli	Sacatepequez, Dispersed	35	18,029	40
Brussels Sprouts				
Plums		390	133,017	44
Peaches		432	86,400	40
Berries		55	12,690	47
Apples		293	66,000	13
Pears		529	117,800	84
Avocados		<u>10,598</u>	<u>1,766,490</u>	53
Total		59,578	\$ 9,493,386	



Information from each of these market areas is summarized:

HUEHUETENANGO MARKET AREA NO. 1

30,000 small farmers

Farm value of fruits & vegetables = \$2,733,482

High volume crops:

Garlic.....3,696 M.T.

Potatoes.....5,078 M.T.

Carrots.....1,487 M.T.

SAN MARCOS, QUEZALTENANGO, TOTONICAPAN MARKET AREA NO. 2

51,000 small farmers

Farm value of fruits & vegetables = \$6,838,824

High volume crops:

Onions..... 3,991 M.T.

Cabbage ..... 11,229 M. T.

Potatoes ..... 10,394 M. T.

Carrots ..... 5,238 M.T.

Beets ..... 1,418 M.T.

Chard ..... 3,607 M.T.

Cauliflower..... 5,600 M.T.

Apples ..... 1,440 M.T.

TECPAN, SOLOLA, QUICHE MARKET AREA NO. 3

30,000 small farmers

Farm value of fruits & vegetables = \$6,830,457

High volume crops:

Onions .....	1,497 M.T.
Cabbage .....	6,550 M.T.
Potatoes .....	3,301 M.T.
Carrots .....	6,032 M.T.
Garlic .....	791 M.T.
Beets .....	2,268 M.T.
Radishes .....	1,149 M.T.
Turnips .....	970 M.T.
Chard .....	1,803 M.T.
Cauliflower .....	4,200 M.T.
Avocadoes .....	3,000 M. T.

GUATEMALA MARKET AREA NO. 4 (including Sacatepequez)

25,000 small farmers

Farm value of fruits & vegetables = \$9,493,386

High volume crops:

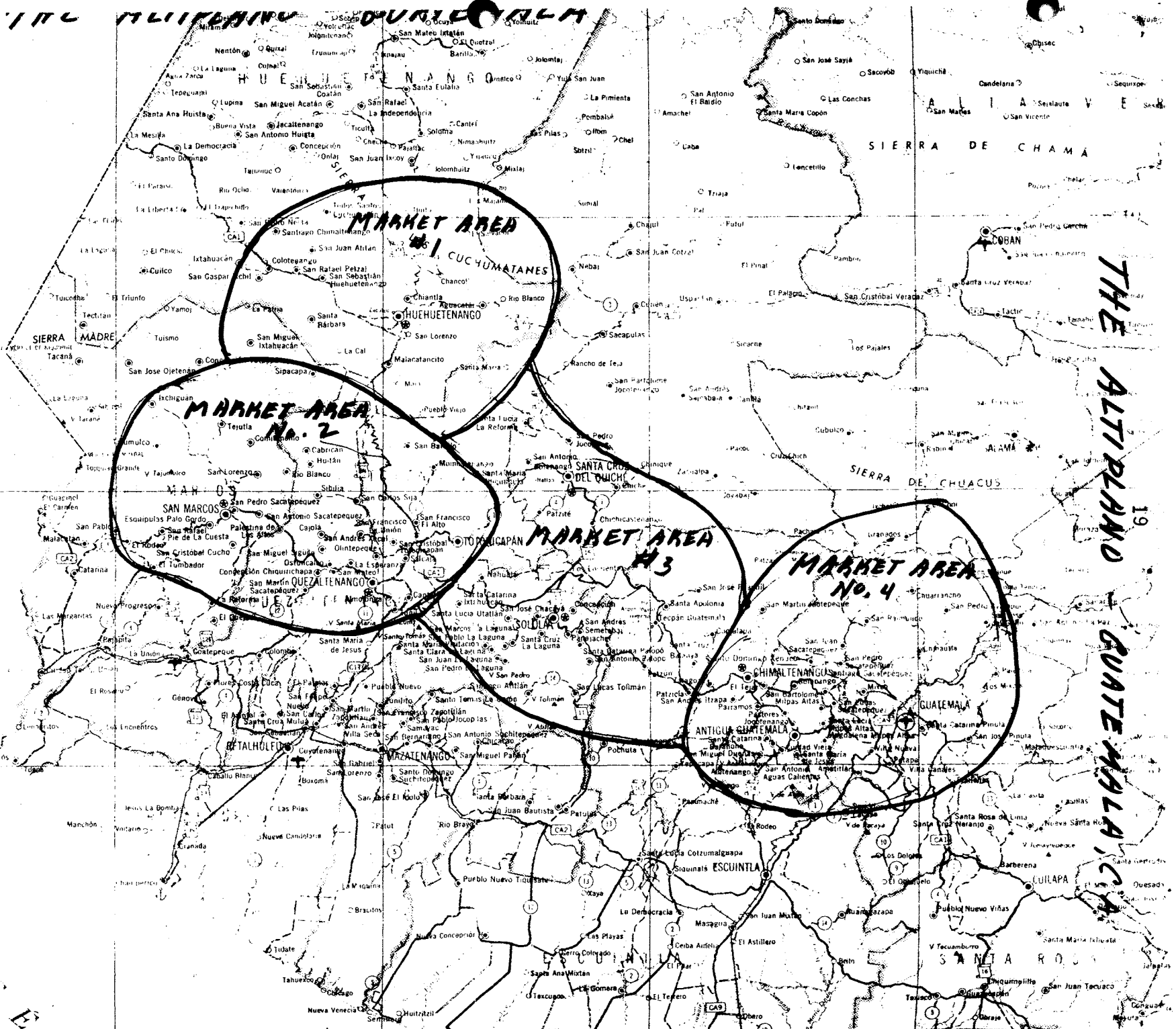
Tomatoes.....	11,911 M.T.
Onions .....	2,328 M.T.

Cabbage.....	5,614 M.T.
Potatoes.....	3,301 M.T.
Carrots .....	3,174 M.T.
Beets .....	1,985 M.T.
Radishes .....	1,915 M.T.
Chard .....	3,607 M.T.
Cauliflower .....	4,200 M.T.
Lettuce.....	3,210 M.T.
Avocadoes .....	10,598 M.T.

The map of the highlands area outlines the above market areas. The boundaries of the market areas are shaped by natural barriers such as mountains and rivers, by location of roads, by location of production areas, by location of centers of population and by nearby market areas.

#### Other Market Area Alternatives

Some other market area alternatives are to check the Solola area and the Chimaltenango area by narrowing the market areas to include only the production coming from those particular municipios. Other market alternatives would involve establishing farmers' markets in the seven areas which were identified earlier in the report as the most densely populated and providing farmers thereby with the opportunity to sell directly to the consuming public in these markets.



THE ATITLANO GUATEMALA, CA

Problems and Concerns Which Should Receive  
Consideration When Developing Market Facility Plans

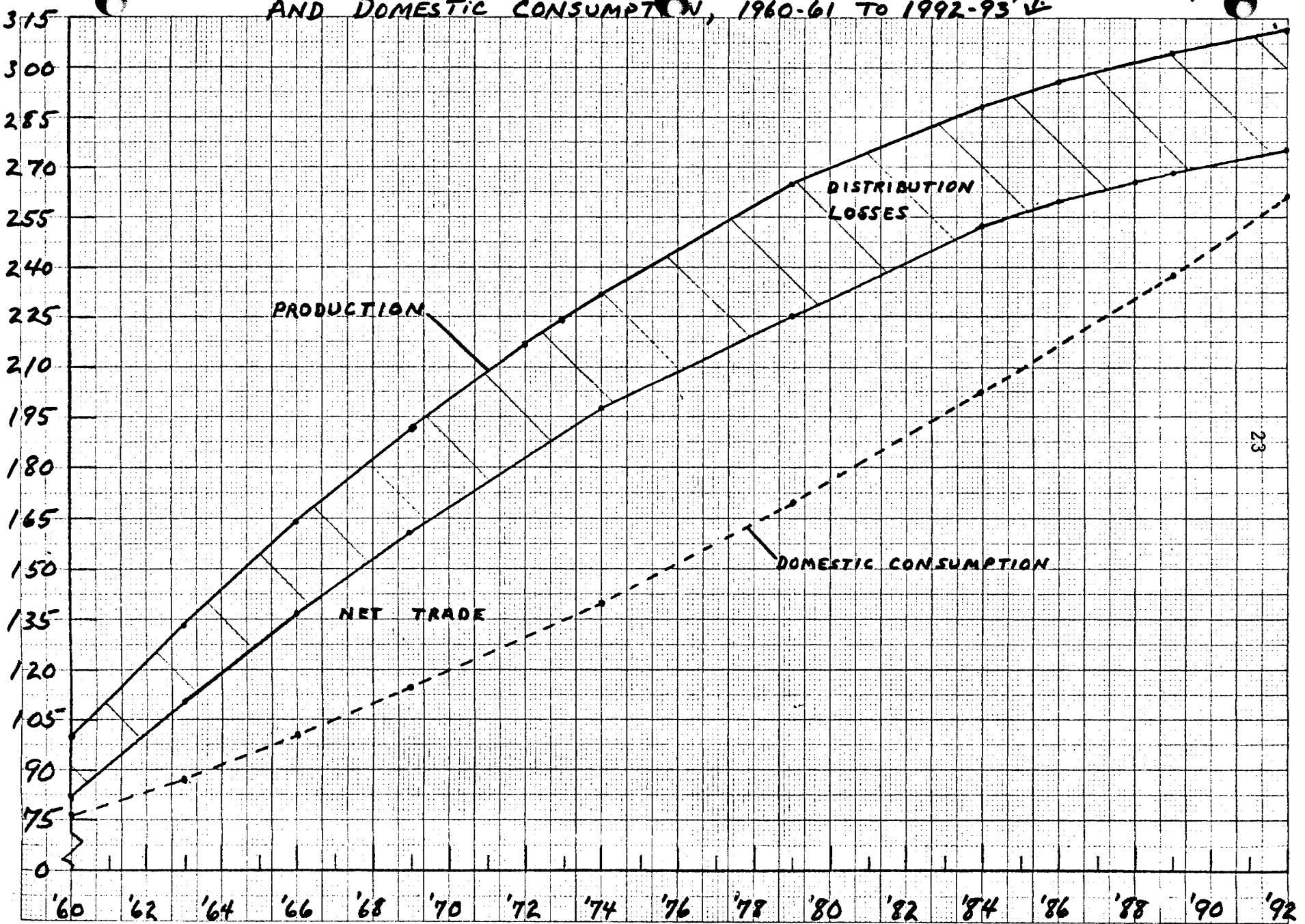
1. How does the small farmer really feel about selling in the present Guatemala City terminal market?
2. How near to the present terminal market can a small farmer sub-assembly facility be located?
3. Will this (or these) market facility be "dropped upon" a market area?  
Will small farmer leaders be involved in the planning/advising process?
4. Can market participation be kept open to all small farmers (rather than present co-op members)?
5. Is the proposed market facility only for small farmers?
6. Will small farmers deliver a quality product for a quality pack?
7. What combination of sub-assembly, sales points and information services is desirable and manageable?
8. How many different commodities can one set of facilities and one management most effectively handle? Multi-product grading and packing plants problems grow rapidly as the number of different kinds of crops handled increases.
9. How do market facilities proposed best fit the Guatemalan situation involving those in the present marketing system while not developing antagonisms which could present major problems to a new organization?

This involves integrating the project into the present marketing system without adding direct costs of marketing at the expense of farm income, while insuring the financial viability of the project. At the same time, the project should have potential for implementing change in the present marketing system while increasing farm income, smoothing seasonal price and supply patterns and improving the quality of the product when it reaches the consumer's hands.

10. Of some concern is the uncertainty of the degree that differing levels of quality are perceived and paid for by buyers in the wholesale market and by consumers at retail.

APPENDIX

AND DOMESTIC CONSUMPTION, 1960-61 TO '1992-93'



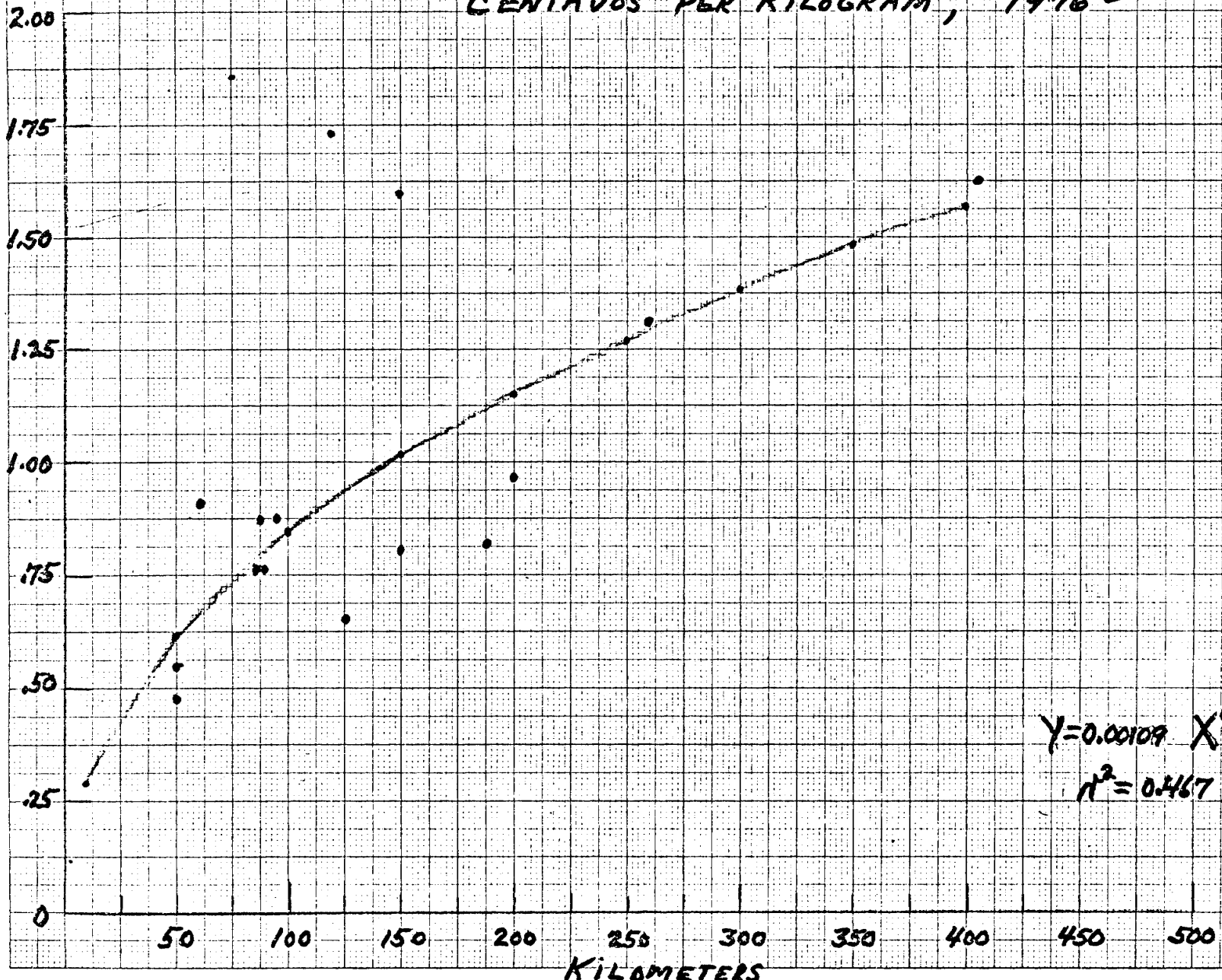
23

↳ USDA/USAID CALCULATIONS, FEBRUARY 1977.



# GUATEMALA FRUIT AND VEGETABLE HAULING COST, CENTAVOS PER KILOGRAM, 1976

¢/KILOGRAM



$$Y = 0.00109 X^{0.44428}$$

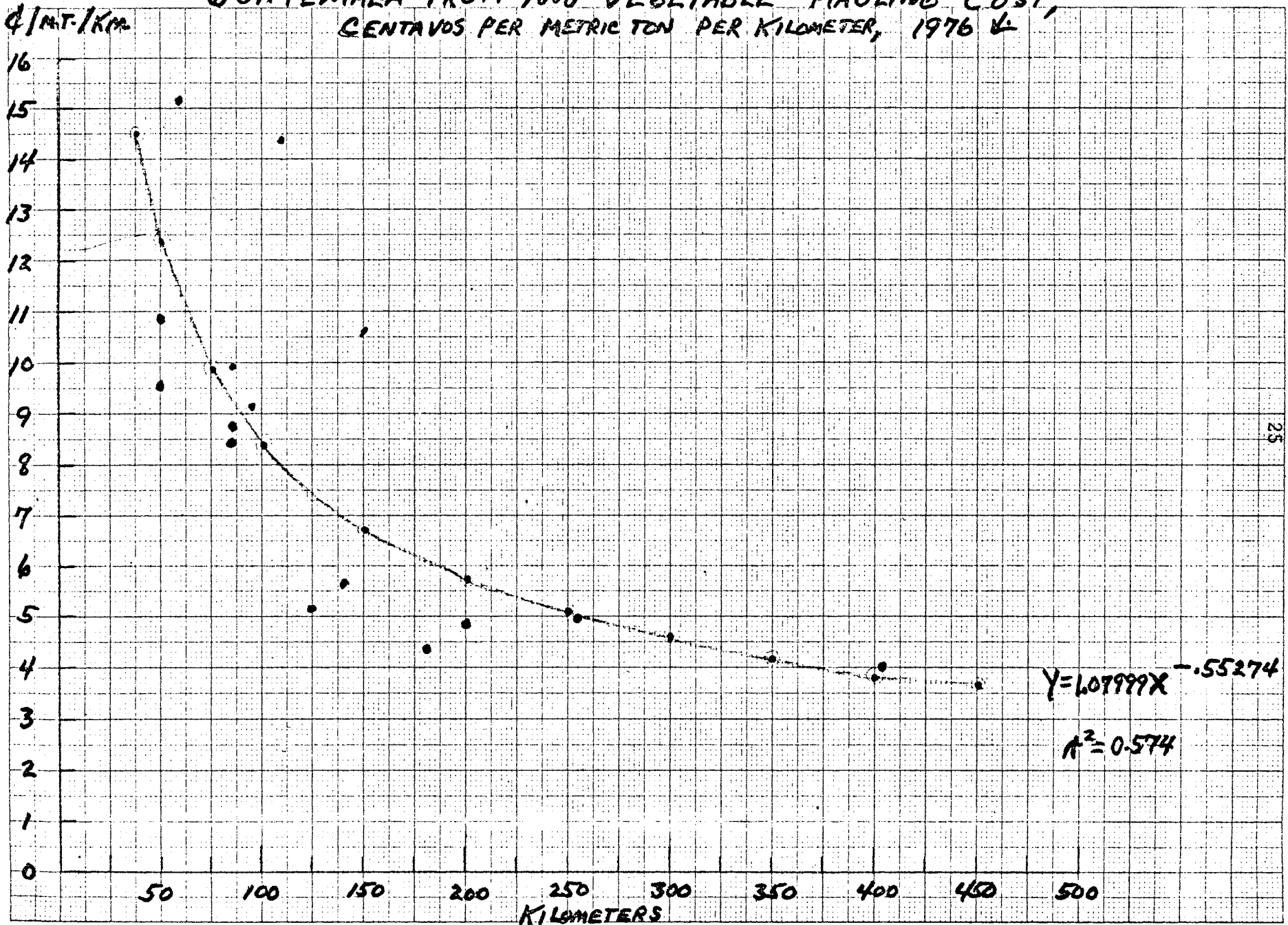
$$r^2 = 0.467$$

24

KILOMETERS

USDA/USAID CALCULATIONS, JANUARY 1977

# GUATEMALA FRUIT AND VEGETABLE HAULING COST, CENTAVOS PER METRIC TON PER KILOMETER, 1976



↓ USDA/USAID CALCULATIONS, JANUARY 1977



INSTITUTO NACIONAL DE COMERCIALIZACION AGRICOLA

## INDECA

DIRECCION DE SERVICIOS TECNICOS  
GUATEMALA C.A.

## GUIA PARA EL ESTABLECIMIENTO DE UN HUERTO COMERCIAL

CULTIVO	CLIMA	EPOCA DE SIEMBRA	FORMA DE SIEMBRA	CANTIDAD DE SEMILLA	DISTANCIA	DISTANCIA	CICLO VEGETATIVO MESES	RENDIMIENTO POR
				POR MANZANA	SURCOS C.M.	PLANTAS C.M.		MANZANA
ACELGA	Templado y frio	todo el año	indistintamente	12 a 15 libras	70 a 80	25 a 30	2 a 2.5	12,000 a 20,000 manojos
APIC	Templado y frio	todo el año	trasplante	6 a 10 onzas	60 a 70	20 a 30	3 a 4	18,000 a 30,000 matas
ALCACHOFA	Templado	febrero a julio	directa	2,500 a 3,000 esq	120 a 140	100 a 120	10 a 12	25,000 a 40,000 cabezas
AJO	Templado	septiembre a octubre	directa	10 a 12 quintales	30 a 35	15 a 20	4 a 5	80 a 130 quintales
ARVEJA	Templado y frio	marzo a noviembre	directa	100 a 120 libras	60 a 80	20 a 25	2 a 3	40 a 70 quintales
BERENJENA	Cálido y templado	febrero a noviembre	trasplante	5 a 8 onzas	70 a 80	50 a 60	3 a 3.5	700 a 900 cajas
BROCOLI	Templado y frio	todo el año	trasplante	4 a 6 onzas	75 a 90	40 a 50	3 a 4	15,000 a 20,000 cabezas
CAMOTE	Cálido y templado	marzo a julio	directa	8,000 a 9,000 trotes	60 a 80	50 a 60	6 a 8	80 a 120 quintales
CEBOLLA	Cálido, templado y frio	mayo a noviembre	trasplante	3.5 a 5 libras	40 a 50	10 a 12	3.5 a 5	300 a 500 quintales
COLIFLOR	Templado y frio	todo el año	trasplante	6 a 8 onzas	70 a 80	40 a 50	2.5 a 3	250 a 400 bultos
CHILE PIMIENTO	Cálido y templado	junio a enero	trasplante	7 a 10 onzas	75 a 85	40 a 50	3 a 4	400 a 700 cajas
CHILE SIERRA	Cálido y templado	agosto a marzo	trasplante	1 a 1.5 libras	90 a 100	50 a 60	5 a 6	150 a 200 quintales
CHILE JALAPÉN	Cálido y templado	abril a noviembre	trasplante	1.5 a 2 libras	100 a 110	40 a 50	4 a 5	350 a 600 cajas
EJOTE	Templado y frio	todo el año	directa	100 a 110 libras	60 a 90	15 a 20	2 a 3	50 a 90 quintales
ESPINACA	Templado y frio	todo el año	directa	20 a 2.4 libras	50 a 60	25 a 30	2 a 3	600 a 800 manojos
ESPARRAGO	Templado y frio	marzo a junio	directa	2500 a 3000 caces	100 a 120	60 a 70	18 a 20	75 a 120 quintales
FRESA	Templado y frio	julio a septiembre	directa	3500 a 4000 est.	40 a 50	40 a 50	2 a 3	200 a 350 quintales
GUISOJIL	Templado y frio	abril a diciembre	directa	12 a 14 bultos	120 a 130	90 a 100	4 a 6	700 a 1,000 bultos
GUICUY	Templado y frio	julio a noviembre	directa	3 a 5 libras	300 a 350	300 a 350	5 a 6	100 a 150 bultos
GUICOYITO	Templado y frio	todo el año	directa	8 a 10 libras	150 a 200	100 a 125	2 a 3	160 a 200 cajas
LECHUGA	Templado y frio	todo el año	indistintamente	6 a 8 onzas	50 a 60	25 a 30	2 a 2.5	30,000 a 50,000 plantas
MELON	Cálido y templado	octubre a abril	directa	2 a 3 libras	150 a 200	80 a 90	3 a 4	500 a 850 cajas
OKRA	Cálido y templado	octubre a febrero	directa	12 a 14 libras	60 a 80	20 a 25	2 a 3	175 a 200 quintales
PAPA	Templado y frio	marzo a diciembre	directa	18 a 20 quintales	50 a 60	30 a 35	3.5 a 4	300 a 600 quintales
PEPINOS	Cálido y templado	febrero a agosto	directa	2 a 3 libras	120 a 150	50 a 60	2 a 3	500 a 800 cajas
PEREJIL	Templado y frio	todo el año	directa	7 a 9 libras	35 a 40	5 a 10	2 a 3	4,000 a 7,000 plantas
PUERRO	Cálido y templado	todo el año	trasplante	3 a 4 libras	30 a 35	10 a 15	3 a 4.5	100 a 200 millares
RABANO	Cálido, templado y frio	todo el año	directa	12 a 15 libras	40 a 50	4 a 6	1 a 2	8,000 a 12,000 manojos
REPOLLO	Templado y frio	todo el año	trasplante	6 a 8 onzas	60 a 80	35 a 40	3 a 4	300 a 600 bultos
REMOLACHA	Templado y frio	todo el año	directa	12 a 16 libras	50 a 60	10 a 12	2 a 3	250 a 400 bultos
SALSIFI	Templado y frio	todo el año	directa	18 a 22 libras	40 a 50	5 a 10	4.5 a 6	3,000 a 5,000 manojos
SANDIA	Cálido y templado	octubre a marzo	directa	3 a 4.5 libras	175 a 200	100 a 125	3 a 4	200 a 450 quintales
TOMATE	Cálido y templado	junio a noviembre	trasplante	5 a 8 onzas	100 a 120	50 a 60	3 a 4	700 a 1,000 cajas
YUCA	Cálido y templado	mayo a septiembre	directa	9,000 a 14,000 est.	90 a 100	120 a 130	6 a 8	400 a 700 quintales
ZANAHORIA	Cálido, templado y frio	todo el año	directa	5 a 7 libras	50 a 60	5 a 8	2.3 a 3	200 a 350 bultos

## EXPLICACIONES:

- A- EL CICLO VEGETATIVO SE REFIERE AL TIEMPO QUE TARDA LA PLANTA DESDE SU SIEMBRA O PLANTACION HASTA SU COSECHA.  
B. EN LAS SIEMBRAS DE TRASPLANTE LA CANTIDAD DE SEMILLA RECOMENDADA SE REFIERE A LA QUE SE UTILIZA EN EL ALMACÉN PARA CUBRIR UNA MANZANA.

## RECOMENDACIONES:

- UN HUERTO COMERCIAL DEBE ESTABLECERSE EN UN LUGAR ACCESIBLE A VEHICULOS, PREFERENTEMENTE A ORILLA DE CARRETERA O PROXIMO A ELLA.
- TERRENOS PLANOS CON PENDIENTE NO MAYOR DEL 15% Y EN CASO DE TOPOGRAFIA ONDULADA, ADOPTESE SISTEMAS TECNICOS DE CONSERVACION DE SUELOS.
- PREFIERESE SUELOS SULTOS, PROFUNDOS, ARENO-ARCILLOSOS, HUMIFEROS Y BIEN DRENADOS.
- UTILICE SEMILLAS CON GARANTIA DE PUREZA, PROVENIENTES DE CASAS DE RECONOCIDA SERIEDAD.
- EFFECTUESE ANALISIS DE SUELOS PREVIO AL CULTIVO DE CUALQUIER ESPECIE HORTICOLA.
- ANTES DE DECIDIRSE A LA SIEMBRA DE UNO O MAS CULTIVOS HORTICOLAS, PARA ASEGURARSE DEL MERCADO, CONSULTE CON LA DIRECCION DE SERVICIOS TECNICOS DE INDECA.

ESTUDIO ELABORADO POR:

PA J ANTONIO HERNANDEZ ALVAREZ  
BR CLEMENS R. HEMMELING A

SEPTIEMBRE, 1975.

December, 1976

GUATEMALA VEGETABLENET FARM RETURNS PER HECTARE

(Leonel González Study, Altiplano)

	<u>\$/Hectare</u>
1. COLIFLOR (Cauliflower)	976.00
2. ESPARRAGO (Asparagus)	933.00
3. BROCOLI (Broccoli)	908.21
4. APIO (Celery)	875.63
5. ESPINACA (Spinach)	834.70
6. ACELGA (Chard)	834.67
7. LECHUGA (Lettuce)	753.24
8. AJO (Garlic)	715.25
9. ZANAHORIA (Carrot)	709.10
10. REMOLACHA (Beet)	681.76
11. CEBOLLA (Onion)	677.20
12. PEPINO (Cucumber)	646.40
13. TOMATE (Tomato)	525.92
14. PAPA (Potato)	515.00
15. NABO (Turnip)	493.69
16. RABANO (Radish)	463.28
17. REPOLLO (Cabbage)	296.46
18. ARVEJA (Peas) (shelled) (in pod)	204.07
19. EJOTES (Green Beans)	184.20
20. BRETONES (Brussel Sprouts)	144.30

SUMMARY OF OPERATIONS OF A FRUIT AND VEGETABLE PROCESSING PLANT  
GUATEMALA CITY

JANUARY 31, 1977

ALIMENTOS KERN DE GUATEMALA, S. A.  
Km. 6½ Carretera Atlántico,  
Guatemala, C.A., Tel. 882040  
Mr. José Francisco Alvarez, Manager

The processing plant for fruits and vegetables is packing product at an annual rate of about 1,000,000 cases per year. Over 60% of the production run are tomatoes and tomatoe products. Other products are carrots, other canned vegetables, fruit juice products, vegetable juices, jams, preserves and jellies.

The plant operates on a three shift basis (24 hours, six days a week) for two to three weeks of the year. On an annual basis the plant operates at about 40% of a total three shift capacity. The plant has a theoretical capacity of about 2,400,000 cases per year.

The plant operates its own can forming facility for their operation for the large volume items. The company buys can sizes for which they do not have large production runs. Glass containers for jams, jellies and related lines are purchased from an in-country manufacturer. Kern management is dissatisfied with the quality of the glass containers purchased.

Kerns contracts production of crops with farmers or farm cooperatives. For example, the 1977 tomatoe contract calls for the taking of all of a growers production that meet standards at \$70.00 per metric ton. Kerns contracts the purchase of crops with farmers or farmer cooperatives. Originally when the plant was started, Kerns grew some tomatoes as a company operation but no longer do. The company does not wish to grow crops.

In addition Kerns also buys commodities by contacting 4 to 6 truck operators to arrange for these operators to assemble truck load quantities from small growers. These truckers are reported to have 12 to 40 trucks each. Some of these reported truck operators may really be truck operator brokers who have access to this number of trucks.

From Kerns viewpoint, the contract production performance is less than satisfactory for securing an adequate supply of commodities. For example, the contract this year on tomatoes calls for payment of \$70.00 per ton at the plant. At this particular moment in time the fresh market price is the equivalent of \$160 per ton. With this price differential, farmers are diverting their production to the fresh market. Kerns has no tomatoes available, for the start of their tomatoe receiving season of January through April.

Kerns management is interested in obtaining additional quantities of commodities now being purchased. They express an interest in obtaining supplies of two additional crops, peas and asparagus.

Kerns management also expressed interest in securing additional supplies of fruits and vegetables, through a small farmer marketing program which would assemble truck load quantities from small farmers.

Kerns processes only canned products and indicated they have no plans to expand into freezing or drying food products.

EW/bar  
2/2/77

MARKETING INFORMATION OF SEVERAL HIGHLAND TOWNS

(December 15 and 16, 1976)

The following information was collected by Ivan Garcia and Dave Fledderjohn in a field trip.

Sources of information were coop leaders in Chimaltenango and Chaquijid, and Mr. Eduardo Matheu in Tecpán.

General Marketing Patterns

The producer takes his product on his back, packed in "redes" (nets), to the closest point along the highway. Sometimes he sells his product on a predetermined day to a particular truck driver, but more often he rides in the truck, with his goods, to the Terminal Market in Guatemala City, paying the usual freight to the driver. If he carries 3 nets or less, he rather takes a bus, where he pays the same freight - or perhaps, 5 to 15 cents more - for his goods plus the ticket for himself.

When the farmer sells to the truck driver, the product is changed from the farmer's nets to the driver's containers - either nets or sisal sacs. One new net costs between \$1.50 and \$2.00 (and) can last for 8 or 10 trips.

At the Terminal Market they pay the usual charges for using the storage room at the market gate. (5 ¢ 1 sack is average).



Sometimes they prefer to sell to an intermediary at the Terminal Market, who owns a storage room and sells later to a truck driver at a higher price - an intermediary can gain 50 ¢ in 100 lbs. of potatoes, by this way.

The farmers normally do not experience losses by rotting.

Traditional recollection points along the road are:

Exit to the highway at Patzicfa,

Tecpán,

Balanyá

Exit from Zaragoza

Quezaltenango Terminal

Chimaltenango: The trip by bus or truck to the Terminal Market takes 1 or  $1\frac{1}{2}$  hour. The usual times during the day for starting the trip is between 5:30 and 7:30 a.m., in the case that the farmer is planning to come back home the same day, or 4. p.m., when he intends to overnight in Guatemala City and sell his product next day early in the morning.

The usual freight in a truck is 20 to 25 cents per 100 lbs.

There is no formal grading by the farmers. They just try to see that the product arrives at the truck or market clean, free of worms, and not too ripe.

Vegetables produced in the area are: Cabbage, potatoe, cauliflower, beets and some broccoli.

Tecpán: Sometimes a group of farmers rent a truck for \$35.00, that can carry up to 10,000 lbs.

Only a few farmers sell their product at the local market. Most of them prefer to sell at the Terminal.

There is grading by the farmers of potatoes and cabbage. The lower quality products are sold at the local market.

The freight costs 25 to 35 cents per bundle ("bulto"). The bus charges \$0.75 or \$1.00 per person to Guatemala City (87 Km. distance).

There is a truck driver in the Tecpán village that charges a freight 10 to 20 cents higher than the usual one for carrying goods directly to La Terminal. Sometimes he also buys directly in the village. He gains \$2.00 or \$3.00 per 100 lbs. of potatoes by buying at the village.

Farmers that live too far from the highway own or rent animals for carrying the product to the truck. Potatoes are sometimes carried in carts propelled by tractors.

Santa Apolonia to Guatemala City

Freight: 40 cents per bundle

Comalapa to Guatemala City

Freight: 40-45 cents per bundle.

Chaquijía (near Sololá)

There is an indian intermediary, living in the town, trusted by the farmers, who buys 30 or 40 bundles and then pays the usual freight to a truck driver (30-40 ¢ per bundle). Farmers know the prices of the products at La Terminal in the last past days, and they are paid in proportion to this known price. The intermediary runs the risk of price changes at La Terminal.

Farmers sell also on occasion at the Sololá market to intermediaries that pay them the same price as the local man.

Of course, some others choose to ride to Guatemala City to sell their own products.

Farmers grade their product and they are paid by the intermediary according to different qualities.

The local intermediary buys in the town on fridays, and comes back from Guatemala City next day. He is a farmer himself. His constant capital for his business as intermediary is of \$200, which he buys the merchandise with.

When a farmer decides to sell - after arriving, he pays the usual 5¢ at the market gate - at La Terminal by himself, he leaves Chaquijía at 1:00 or 2.p.m. He knows friends that inform him what the current prices, <sup>are/</sup> and is able to sell 5 or 10 minutes after arriving. The bus ticket costs \$1.00.

Pixabaj: There are 4 or 5 producers, organized in a kind of cooperative. One local intermediary owns a truck, and makes the same service as the one at Chiquijá (the farmers of that place sell also sometimes to the truck owner of Pixabaj). They sell several truck loads per week.

Almolonga: Their products get the highest prices, because of their superior quality.

Several farmers joint their producces, rent a truck and drive themselves to La Terminal.

They also sell in Sololá to drivers that go to Mexico.

Prices:

Cabagge: \$1.50 (red" (2-3 doc) at Chaquijfa.  
 \$ 2.25-2.50 at Chimaltenango  
 \$ 3.50-4.00 at La Terminal (paid by truckers)

Potatoe: \$10/quintal at Chimaltenango  
 \$ 12 at Tecpán  
 \$12-13 at La Terminal

Cauliflower: \$2.25 per "bulto" (1-2 doc.) at La Terminal  
 Prices per "quintal" in Chimaltenango:25-50 ¢ lower)

Beets: 80 ¢ "bulto" (10-15 doc.) at Chimaltenango  
 15 ¢ doc. at Chaquijfa.

Apples: 9 ¢/ lb. (wholesale) at Tecpán, 20¢/lb. (retail)  
 10-11 ¢ lb. (wholesale) at La Terminal  
 25 ¢/lb. (retail) at La Terminal.

Brusell Sprouts: 10 ¢/lb. (sold to a market from a Tecpán producer)

Broccoli: 12 ¢/head (id.)

Carrot: 10c/ doc. at Chaquijfa.