ERS-115

Truck Crop Production Practices

CAMERON AND HIDALGO COUNTIES, TEXAS

Labor, Power, and Materials, by Operation

Farm Production Economics Division
Economic Research Service
U. S. Department of Agriculture

CONTENTS

Previous publications in this group of reports on 1959 truck crop production practices covered the following areas:

Publication No.	Area Covered
ARS 43-132	Columbia County, Wis.
ERS-45	Accomack and Northampton Counties, Va.
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ERS-82	Colquitt County, Ga.

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TRUCK CROP PRODUCTION PRACTICES CAMERON AND HIDALGO COUNTIES, TEXAS

Labor, Power, and Materials by Operation

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INTRODUCTION

In 1961, the United States production of truck crops for fresh market and processing occupied nearly 3.5 million acres of cropland. These crops used slightly more than 1 percent of the total cropland. The farm value of truck crops harvested for sale approached $1.2 billion, or an average of $333 per acre harvested. 1/

Although the total acreage of truck crops is small, it is highly concentrated in areas with conditions favorable for production of these crops. The major areas are in California, Florida, Texas, the Eastern Seaboard from Georgia to Long Island, N. Y., the States bordering the Great Lakes, and the Pacific Northwest.

Truck crops in general require intensive labor. In addition, the labor requirements are highly seasonal, with several labor peaks, the highest of which occurs at harvesttime.

Most truck-crop operations other than land preparation are difficult to mechanize. Thinning and weeding are two preharvest operations still performed largely by hand labor. Harvesting of a majority of truck crops is still predominantly a hand operation. In addition, most of these crops require repetitive pickings, which must be timely, as quality deteriorates very rapidly if the crops are not harvested at the optimum time.

These high labor demands have been difficult to meet, particularly during such peak periods as weeding, thinning, and harvesting. Most truck-crop areas do not have sufficient local labor available to handle the crops during these periods. This has led to the migration of many thousands of workers from one area to another during the peak seasons to work on vegetables. In addition, many thousands of foreign workers are imported annually to help satisfy these heavy seasonal labor demands.

Purchased inputs comprise a high proportion of the total inputs in the production of these crops. Most labor is hired. Fertilizer, seed, pesticides, and containers are significant items that are usually purchased. From 1953 to 1961, prices of these inputs increased relative to prices received for truck crops.

1/ U. S. Department of Agriculture Crop Reporting Board. Vegetables—Fresh Market 1961 Annual Summary—Acreage, Production, and Value of Principal Commercial Crops. Vg. 2-2-(61).

U. S. Department of Agriculture Crop Reporting Board. Vegetables—Processing 1961 Annual Summary—Acreage, Production, and Value of Principal Commercial Crops. Vg. 3-2-(61).

To gain further knowledge of some of the inputs involved in production of vegetables, information regarding the 1958-59 crop was obtained from 2,496 vegetable growers in 12 areas. 2/ The areas sampled were the counties of (1) Erie, N. Y., (2) Accomack and Northamption, Va., (3) Colquitt, Ga., (4) Broward and Palm Beach, Fla., (5) Cameron and Hidalgo, Tex., (6) Berrien and Van Buren, Mich., (7) Columbia, Wis., (8) Yakima, Wash., (9) Marion, Oreg., (10) Imperial, Calif., (11) Monterey, Calif., and (12) San Joaquin, Calif.

The areas included in the survey were selected on the basis of importance of seasonal and overall production, diversity of crops grown--both for fresh market and for processing--and number and proportion of farmers harvesting truck crops for sale. 3/

This report presents information on labor requirements, production practices, and costs involved in the production of truck crops in Cameron and Hidalgo Counties, Tex. (fig. 1). It is the fifth in a group covering the 12 survey areas.

A separate report covering all 12 areas will present information on the extent to which production of truck crops has become vertically integrated by either ownership or contractual agreements.

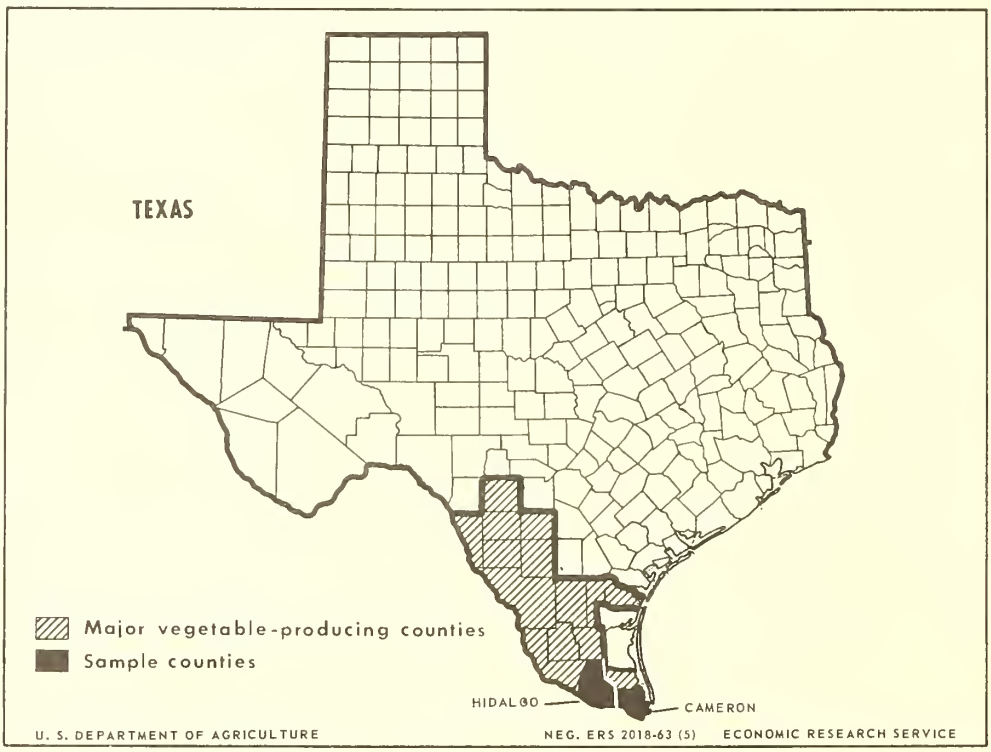

Figure 1

2/ The Crossley S-D Surveys, Inc., under U. S. Department of Agriculture, Agricultural Research Service contract #12-14-100-3826(43), conducted the field survey and made preliminary tabulations. The author is responsible for the analysis of the data.

3/ Based on data cited in footnote 1 as well as the 1958 annual summaries of the same series; also the U. S. Department of Commerce Census of Agriculture, 1954, vols. I and II.

CHARACTERISTICS OF CAMERON AND HIDALGO COUNTIES, TEXAS

Cameron and Hidalgo Counties are the two southernmost counties in Texas. They border the Rio Grande River as it enters the Gulf of Mexico (fig. 1). These two counties, along with Willacy County, comprise an area known as the Lower Rio Grande Valley. In the Lower Valley climate is semi-tropical, with an average frost-free period of more than 300 days. Soils range from heavy clays along the river to light sand in the northern part of the area. Rainfall is highly variable but averages about 25 inches a year.

Irrigation is widely practiced in the Lower Valley, but extent of use varies with soil conditions and availability of water. Of the total cropland harvested in 1959, Hidalgo County had 84 percent under irrigation; Cameron County, 63 percent; and for both counties, 75 percent was irrigated. 4/

Vegetable production in Cameron and Hidalgo Counties is exceeded in acreage only by cotton and grain sorghums. A total of 128,456 acres of vegetables were harvested for sale on 2,319 farms in the two counties in 1959. Compared with the total Texas vegetable industry, these two counties grew nearly two-fifths of the acreage on one-fifth of the farms. Sales of their vegetable production exceeded $10.5 million, or 39 percent of the total for the State. (See footnote 4.)

In the fall and winter of 1959-60, information regarding the 1958-59 crop was obtained by personal interview with 484 farm operators in Cameron and Hidalgo Counties who harvested vegetables for sale. This was a 21-percent sample of all truck-crop farms in the two counties.

The survey population was defined as all farmers in Cameron and Hidalgo Counties, Texas, producing truck crops for sale whose farm headquarters were located within the survey area, except growers residing outside the counties and more than 20 road miles from their headquarters. Within the survey area, a randomized area sampling plan was used to obtain the desired number of respondents.

The 484 farms included in the study had an average of 136 acres of cropland. Of this, 38.2 acres were in truck crops--34.9 for fresh market use and 3.3 for processing. Most farms produced only one truck crop. Fewer than 8 percent of these farms grew 3 or more truck crops (table 1). However, a wide variety of vegetable crops was grown on these farms. Table 2 lists 15 vegetables grown for fresh market use, for processing, or for both. This report presents information on production of 14 vegetables for the fresh market and 4 for processing.

Cotton is the major crop grown on the irrigated land in the Lower Valley. As a measure in controlling the pink bollworm, a State regulation exists which makes it mandatory for cotton growers to plow under all cotton acreage by August 31 in Cameron and the lower half of Hidalgo Counties. The plow-under date for the northern part of Hidalgo County is September 25.

4/ 1959 Census of Agriculture, v. I, pt. 37.

Table 1.--Sample farms: Number, average acreage of cropland, and distribution by number of truck crops produced by farms in each size group, Cameron and Hidalgo Counties, Texas, 1958-59

Cropland operated (acres)	Farms in size group	Average acreage of cropland per farm	Distribution by number of crops produced							
			1	2	3	4	5	6	7	8
	Number	Acres	Farms	Farms	Farms	Farms	Farms	Farms	Farms	Farms
Under 30.0	160	16.0	145	14	1	0	0	0	0	0
30.0 to 99.9	157	53.6	111	38	7	1	0	0	0	0
100.0 to 259.9	99	159.8	56	28	9	2	2	0	2	0
260.0 to 499.9	38	351.3	21	8	6	2	1	0	0	0
500.0 to 999.9	23	614.6	12	8	0	3	0	0	0	0
1,000 and over	7	1,668.1	2	3	0	1	0	0	0	1
Total or average	484	136.3	347	99	23	9	3	0	2	1

Table 2.--Production of truck crops, by market use, 484 farms, Cameron and Hidalgo Counties, Tex., 1958-59

Crop	Farms on which crops were grown for-		Total acreage harvested			Average acreage harvested per farm		
	Fresh market	Processing	Fresh market	Processing	Total	Fresh market	Processing	Total
	Number	Number	Acres	Acres	Acres	Acres	Acres	Acres
Snap beans	4	11	66	191	257	16	17	17
Beets	19	11	201	355	556	11	32	19
Broccoli	14	1	254	33	287	18	33	19
Cabbage	115	1	2,784	15	2,799	24	15	24
Carrots	135	11	4,121	273	4,394	31	25	30
Sweet corn	18	1	655	9	664	36	9	35
Lettuce	12	0	365	0	365	30	0	30
Okra	17	0	149	0	149	9	0	9
Onions	23	2	917	40	957	40	20	38
Black-eyed peas	33	0	1,862	0	1,862	56	0	56
Sweet peppers	15	1	539	10	549	36	10	34
Squash	13	0	169	0	169	13	0	13
Tomatoes	171	10	3,517	490	4,007	21	49	22
Turnips	9	0	77	0	77	9	0	9
Watermelons	8	0	408	0	408	51	0	51
Other 1/	---	---	805	161	966	---	---	---
Total	---	---	16,889	1,577	18,466	---	---	---

1/ Includes cantaloup, cauliflower, collards, cucumbers, dandelion greens, endive, mustard greens, green onions, parsley, radishes, and spinach.

Vegetables are generally planted to follow cotton, and thus land preparation for many truck crops is started as the cotton is plowed. Fitting of land for the more tender crops, such as sweet peppers and squash, may be delayed until late fall, with planting postponed until danger of frost is past. There is, however, some early planting done for fall harvesting of both these crops. Shredding stalks and plowing cotton was not universally charged to the cotton enterprise. Some of this work is included as land fitting for the vegetables following the cotton.

Irrigation was generally practiced on all vegetables included in this report, except watermelons. This crop was grown on nonirrigated sandy soil in the northern part of the area. Irrigation costs as reported herein include the basic fee for irrigation and drainage plus fees per application of water. Basic fees and rates per unit of water applied varied greatly. Therefore, total cost for water and drainage was divided by the number of applications, to arrive at the reported cost per application figure.

Selling a crop while it is still growing in the field is a practice followed by many vegetable growers in the Lower Valley. Practices and inputs reported in this publication represent only those incurred on a crop by the farmer or his crew up to the point of sale. Thus, there are no harvest inputs for watermelons as the entire acreage of this crop on the survey farms was sold unharvested. Crews hired by the buyers performed the harvesting operations. A rather substantial harvesting cost item was not obtained from growers in this survey. With the exception of the sweet corn and squash enterprises, no container costs are reported; these costs were not obtained.

VEGETABLES FOR FRESH MARKET

The crops included in this section are those which, at time of planting, the grower intended to produce for the fresh market.

Beets

Data presented in figure 2 and tables A, B, C, and D are based on information obtained covering production of table beets for the fresh market on 200 acres on 19 farms in 1958-59. The average yield per acre was 6.52 tons of bunched beets.

Tractors were the chief source of power on these farms. Unless otherwise indicated, they were used for operations listed. The size of tractor was not obtained, but considering the size of equipment used, it appears that these tractors were 2- and 3-plow tractors with drawbar horsepower ratings of 15 to 30.

Beets are generally sold in the field--either lifted or still growing. On the survey farms, slightly more than half of the acreage was either pulled by hand or machine lifted by farm crews before sale of beets. The remaining acreage was still growing at time of sale. Buyers perform the bulk of the harvesting operations. They typically top or bunch, crate, load, and haul the beets to the grading and washing shed for packaging for market.

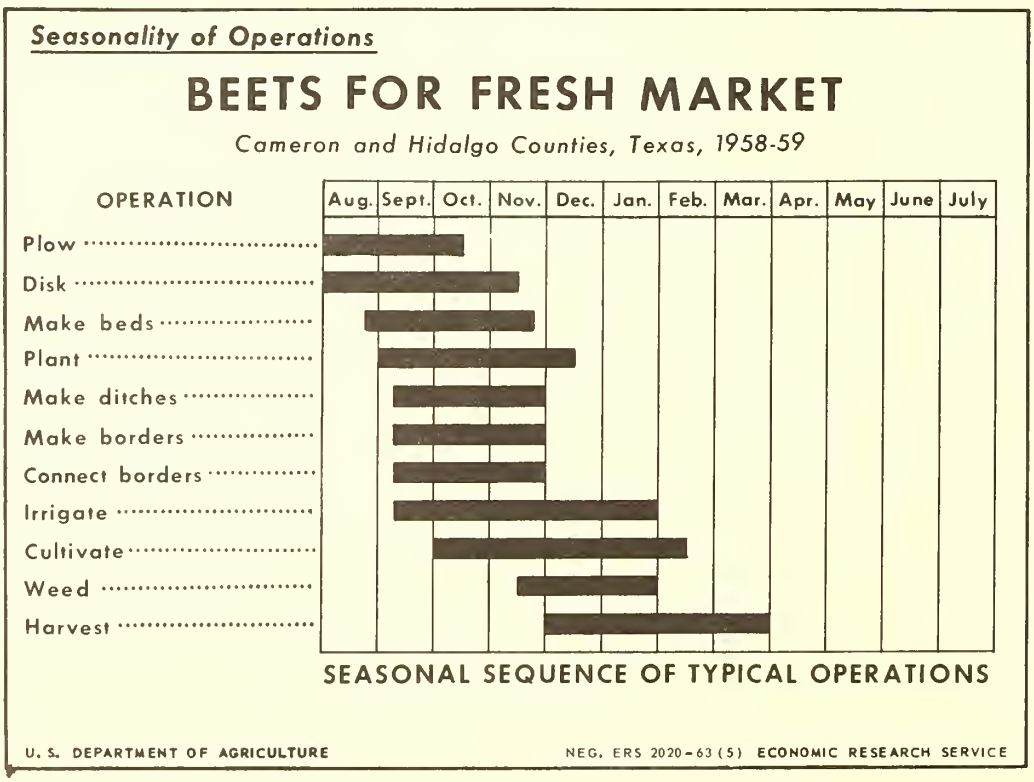

Figure 2

Table A.--Beets: Materials used and contract work hired, averages for 200 acres on 19 farms, Cameron and Hidalgo Counties, Texas, 1958-59

Item	Unit	Units per acre covered	Price per unit	Cost per acre covered	Percentage of total acreage covered	Cost per acre, total acreage
		Number	Dollars	Dollars	Percent	Dollars
Materials used:						
Seed	Lb.	6.7	1.33	8.91	100	8.91
Fertilizer, 33-0-0	Cwt.	2.0	4.00	8.00	32	2.56
Fertilizer, 82-0-0	Cwt.	1.5	10.00	15.00	19	2.85
Dust, c.o.c.s.	Lb.	50	.20	10.00	19	1.90
Spray, toxaphene	Qt.	2	.75	1.50	11	.16
Irrigation fees	Applic.	2.4	1.77	4.25	100	4.25
Total		---	---	---	---	20.63
Contract work hired:						
Dust by plane, includes dust	Acre	3	11.25	33.75	2	.68
Total		---	---	---	---	.68
Total materials and contract work		---	---	---	---	1/ 21.31

1/ Average yield per acre - 6.52 tons. Average cost of materials and contract work per ton - $3.27.

Table B.--Beets: Labor, power, and machinery used in producing and harvesting, by operation, averages for 200 acres on 19 farms, Cameron and Hidalgo Counties, Texas, 1958-59

Operation	Type and size of equipment	Time per acre, once over		Times over, acreage covered	Percentage of total acreage covered	Time per acre, total acreage	
		Man	Power			Man	Power
		Hours	Hours	Number	Percent	Hours	Hours
Preharvest:							
Plow	3-bot. disk plow	1.4	1.4	1.0	68	1.0	1.0
Disk	8-foot tandem	.7	.7	2.8	68	1.3	1.3
Roll	6-foot roller	1.0	1.0	1.0	10	.1	.1
Float	10-foot	.6	.6	1.0	11	.1	.1
List	2-row middlebuster	.7	.7	1.0	15	.1	.1
Make beds	2-row bedder	1.1	1.1	1.3	95	1.4	1.4
Plant	2-row seeder	1.3	1.1	1.0	100	1.3	1.1
Make ditches	shaper	.5	.5	1.0	100	.5	.5
Make borders	border disk	.4	.4	1.0	100	.4	.4
Connect borders by hand	---	1.1	---	1.0	100	1.1	---
Irrigate	---	3.1	---	2.4	100	7.4	---
Cultivate	2-row cultivator	1.1	1.1	3.4	82	3.1	3.1
Fertilizer by hand	---	3.5	---	1.0	1/ 12	.4	---
Fertilize	2-row distributor	1.0	1.0	1.0	20	.2	.2
Weed by hand	---	16.1	---	1.1	64	11.3	---
Hoe by hand	---	12.5	---	1.6	20	4.0	---
Spray	6-row boom	.4	.4	1.0	11	2/	2/
Dust	4-row duster	.6	.6	2.1	19	.2	.2
Dust (custom)	plane	2/	2/	3.0	2	2/	2/
Total	---	---	---	---	---	33.9	9.5
Harvest:							
Pull by hand	---	45.0	---	1.0	37	16.6	---
Lift by machine and top by hand	2-row lifter	24.0	2.7	1.0	19	4.6	.5
Total 3/	---	---	---	---	---	21.2	.5
Total preharvest and harvest	---	---	---	---	---	4/ 55.1	4/ 10.0

1/ Anhydrous ammonia applied in irrigation water on an additional 19 percent of the acreage.
2/ Less than 0.05 hour.
3/ 44 percent of the acreage was sold unharvested in the field, that which is lifted by farmers is then sold with the buyer conducting the remaining harvesting operations.
4/ Average yield per acre - 6.52 tons. Average labor and power used per ton - 8.5 hours and 1.5 hours, respectively.

Table C.--Beets: Usual labor and power inputs, Cameron and Hidalgo Counties, Texas, 1958-59

Operation	Times over	Time per acre, once over		Time per acre, total	
		Man	Power	Man	Power
	Number	Hours	Hours	Hours	Hours
Plow	1	1.4	1.4	1.4	1.4
Disk	3	.7	.7	2.1	2.1
Make beds	1	1.1	1.1	1.1	1.1
Plant	1	1.3	1.1	1.3	1.1
Make ditches	1	.5	.5	.5	.5
Make borders	1	.4	.4	.4	.4
Connect borders	1	1.1	---	1.1	---
Irrigate	2	3.1	---	6.2	---
Cultivate	3	1.1	1.1	3.3	3.3
Weed	1	16.1	---	16.1	---
Pull by hand	1	45.0	---	45.0	---
Total	---	---	---	1/ 78.5	9.9

1/ When harvested by farmers.

Table D.--Beets: Distribution of workers performing specified operations, by type of worker, 19 farms, Cameron and Hidalgo Counties, Texas, 1958-59

Operation	Type of worker			
	Operator and unpaid family	Year-round hired	Local seasonal	Foreign
	Percent	Percent	Percent	Percent
Plow	64	22	7	7
Disk	57	22	7	14
Roll	100	0	0	0
Float	0	100	0	0
List	50	0	0	50
Make beds	75	15	5	5
Plant	73	19	4	4
Make ditches	0	100	0	0
Make borders	0	50	0	50
Connect borders	50	0	0	50
Irrigate	63	19	11	7
Cultivate	67	16	6	11
Fertilize by hand	100	0	0	0
Fertilize	67	0	0	33
Weed	38	11	33	18
Hoe	29	0	71	0
Spray	50	0	0	50
Dust 1/	100	0	0	0
Hand harvest	31	0	30	39
Machine harvest	50	7	43	0

1/ Does not include custom dusting by airplane.

The data in figure 3 and tables A, B, C. and D are based on information obtained covering production of broccoli for the fresh market on 248 acres on 14 farms. The average yield per acre was 37.5 hundredweight.

Tractors were the chief source of power on these farms. Unless otherwise indicated, they were used for operations listed. The size of tractor was not obtained, but, considering the size of equipment used, it appears that the average tractor was about a 2-plow size with a drawbar horsepower rating of 15 to 20.

The majority of farmers producing broccoli direct-seed their fields. Generally, the growers of large acreages are the ones who maintain plantbeds and set transplants in the fields. Unlike most other crops in the area, broccoli is harvested by the farmer, rather than sold unharvested. Piece rates paid for cutting broccoli ranged from $0.20 to $0.90 per 2 1/2-dozen bunches. The average of the rates reported was $0.72.

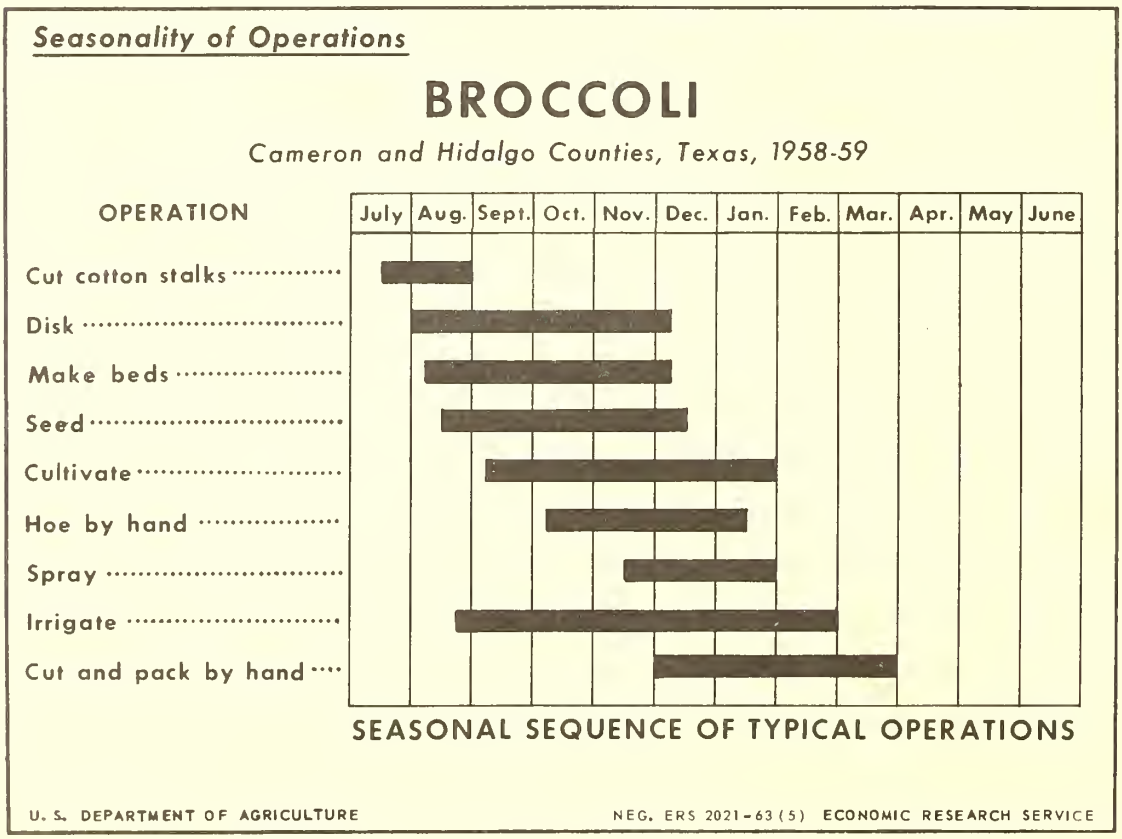

Figure 3

Table A.--Broccoli: Materials used and contract work hired, averages for 248 acres on 14 farms, Cameron and Hidalgo Counties, Texas, 1958-59

Item	Unit	Unit per acre covered	Price per unit	Cost per acre covered	Percentage of total acreage covered	Cost per acre, total acreage
		Number	Dollars	Dollars	Percent	Dollars
Plantbed (4.0 acres on 2 farms):						
Materials used:						
Seed	Lb.	4.5	3.42	15.39	100	15.39
Fertilizer, 16-20-0	Cwt.	1.6	3.30	5.28	25	1.32
Dust, toxaphene	Lb.	50	.08	4.00	75	3.00
Dust, DDT	Lb.	33	.15	4.95	25	1.24
Irrigation fees	Acre	3	1.50	4.50	100	4.50
Total plantbed	---	---	---	---	---	25.45
Total per acre field broccoli	---	---	---	---	---	1/ .91
Field (248 acres on 14 farms):						
Materials used:						
Plantbed 1/	do.	1.0	.91	.91	44	.40
Seed	Lb.	1.12	3.39	3.80	56	2.13
Dust, toxaphene-parathion	Lb.	21.9	.13	2.85	54	1.54
Fertilizer, 16-20-0	Cwt.	1.9	3.60	6.84	54	3.69
Spray, phosdrene	Gal.	.3	11.25	3.38	52	1.76
Irrigation fees	Acre	1.8	2.05	3.69	82	3.03
Total	---	---	---	---	---	2/ 12.55
Contract work hired:						
Spray by plane, plane and materials	Acre	1.0	5.34	5.34	12	.64
Total	---	---	---	---	---	.64
Total materials and contract work	---	---	---	---	---	3/ 13.19

1/ One acre of plantbed produced plants for 28 acres of broccoli.
2/ Excludes container costs which were not obtained.
3/ Average yield per acre - 37.5 cwt. Average cost of materials and contract work per cwt. - $0.35.

Table B.--Broccoli: Labor, power, and machinery used in producing and harvesting, by operation, averages for 248 acres on 14 farms, Cameron and Hidalgo Counties, Texas, 1958-59

Operation	Type and size of equipment	Time per acre, once over		Times over, acreage covered	Percentage of total acreage covered	Time per acre, total acreage	
		Man	Power			Man	Power
		Hours	Hours	Number	Percent	Hours	Hours
Plantbed (4.0 acres on 2 farms):							
Plow	2-bot. disk	2.5	2.5	2.0	100	5.0	5.0
Disk	8-foot tandem	.9	.9	4.0	100	3.6	3.6
Bed	2-row bedder	3.2	3.2	1.0	100	3.2	3.2
Plant	1-bed seeder	5.0	2.5	1.0	100	5.0	2.5
Fertilize	1-bed distributor	6.0	3.0	1.0	25	1.5	.8
Cultivate	1-bed cultivator	2.9	2.9	1.5	100	4.4	4.4
Hoe by hand	---	54.0	---	1.0	75	40.5	---
Dust	2-bed duster	3.0	2.4	2.4	100	7.2	5.8
Irrigate	---	3.1	---	3.2	100	9.9	---
Lift plants by hand	---	435.1	---	1.0	100	435.1	---
Total plantbed	---	---	---	---	---	515.4	25.3
Total per acre field broccoli 1/	---	---	---	---	---	18.4	.9
Field (248 acres on 14 farms):							
Preharvest:							
Plantbed 1/	---	18.4	.9	1.0	44	8.1	.4
Cut stalks	2-row shredder	.5	.5	1.0	55	.3	.3
Plow	2 bot. disk	2.0	2.0	1.0	16	.3	.3
Disk	8-foot tandem	.8	.8	3.6	100	2.9	2.9
Level	10-foot float	.9	.9	1.0	14	.1	.1
List	2-row middlebuster	1.2	1.2	1.0	10	.1	.1
Make beds	4-row middlebuster	.6	.6	1.8	70	.8	.8
Seed	4-row planter	1.0	1.0	1.0	56	.6	.6
Set transplants by hand	---	41.3	---	1.0	44	18.2	---
Irrigate	---	2.5	---	1.8	82	3.7	---
Fertilize by hand	---	4.0	---	1.0	5	.2	---
Fertilize	4-row distributor	1.0	1.0	2.0	4	.1	.1
Cultivate and fertilize	4-row cult. /attach.	1.0	.8	1.0	44	.4	.4
Cultivate	4-row cultivator	.8	.8	2.9	100	2.3	2.3
Spray	8-row boom	.3	.3	1.1	52	.2	.2
Hoe	---	8.1	---	1.4	31	3.5	---
Hoe and thin	---	11.8	---	1.7	21	4.2	---
Thin	---	17.5	---	1.0	7	1.2	---
Spray (custom)	Plane	2/	2/	1.0	12	2/	2/
Dust	8-row speed duster	.3	.3	1.0	47	.1	.1
Dust by hand	---	2.7	---	1.6	7	.3	---
Total	---	---	---	---	---	47.6	8.6
Harvest:							
Cut and pack by hand	---	11.6	---	5.5	100	63.8	---
Total	---	---	---	---	---	63.8	.0
Total preharvest and harvest		---	---	---	---	3/ 111.4	3/ 8.6

1/ One acre of plantbed produced plants for 28 acres of broccoli.
2/ Less than 0.05 hour.
3/ Average yield per acre - 37.5 cwt. Average labor and power used per cwt. - 3.0 hours and 0.2 hour, respectively.

Table C.--Broccoli: Usual labor and power inputs, Cameron and Hidalgo Counties, Texas, 1958-59

Operation	Times over	Time per acre, once over		Time per acre, total	
		Man	Power	Man	Power
	Number	Hours	Hours	Hours	Hours
Cut stalks	1	0.5	0.5	0.5	0.5
Disk	4	.8	.8	3.2	3.2
Make beds	2	.6	.6	1.2	1.2
Seed	1	1.0	1.0	1.0	1.0
Irrigate	2	2.5	---	5.0	---
Cultivate	3	.8	.8	2.4	2.4
Hoe	1	8.1	---	8.1	---
Spray	1	.3	.3	.3	.3
Cut by hand	5.5	11.6	---	63.8	---
Total	---	---	---	85.5	8.6

Table D.--Broccoli: Distribution of workers performing specified operations, by type worker, 14 farms, Cameron and Hidalgo Counties, Texas, 1958-59

Operation	Type of worker				
	Operator and unpaid family	Year-round hired	Local seasonal	Domestic migratory	Foreign
	Percent	Percent	Percent	Percent	Percent
Plantbed, total	40	40	20	0	0
Cut stalks	100	0	0	0	0
Plow	88	0	0	12	0
Disk	69	0	15	8	8
Level	70	0	0	0	30
List	50	0	50	0	0
Make beds	72	14	0	0	14
Seed	77	0	15	0	8
Set transplants	17	0	83	0	0
Irrigate	44	4	35	4	13
Fertilize	89	0	0	11	0
Fertilize by hand	100	0	0	0	0
Cultivate and fertilize	0	100	0	0	0
Cultivate	65	12	12	6	5
Spray 1/	50	50	0	0	0
Hoe	2	0	26	0	72
Hoe and thin	83	0	0	17	0
Thin	46	0	46	8	0
Dust	50	50	0	0	0
Dust by hand	100	0	0	0	0
Harvest	6	0	33	0	61

1/ Excluded custom operations.

Figure 4 and tables A, B, C, and D are based on information obtained covering production of cabbage for the fresh market on 2,320 acres on 113 farms in 1958-59. The average yield per acre was 7.6 tons.

Tractors were the chief source of power on these farms. Unless otherwise indicated, they were used for operations listed. Drawbar horsepower ratings were not obtained in this survey, but size of equipment used indicates that these tractors were 2- and 3-plow tractors with drawbar horsepower ratings of 15 to 30.

Most cabbage was seeded directly in the field. Only 6 percent of the acreage was planted with purchased plants. A few growers raised their own plants and transplanted to the field. Insufficient data were obtained on plant-bed operations, so they were excluded.

Direct-seeded cabbage fields generally require considerable thinning to get the desired plant stands. Combined with hoeing and weeding, thinning required 31 hours per acre. This was nearly half the total preharvest labor input.

Production on one-third of the cabbage acreage was sold unharvested in the field. Buyers sent their own crews in to harvest the crop. Acreage harvested by farmer-supervised crews was cut nearly 4 times. Local seasonal workers made up the bulk of the harvesting crews. No piece rates were reported.

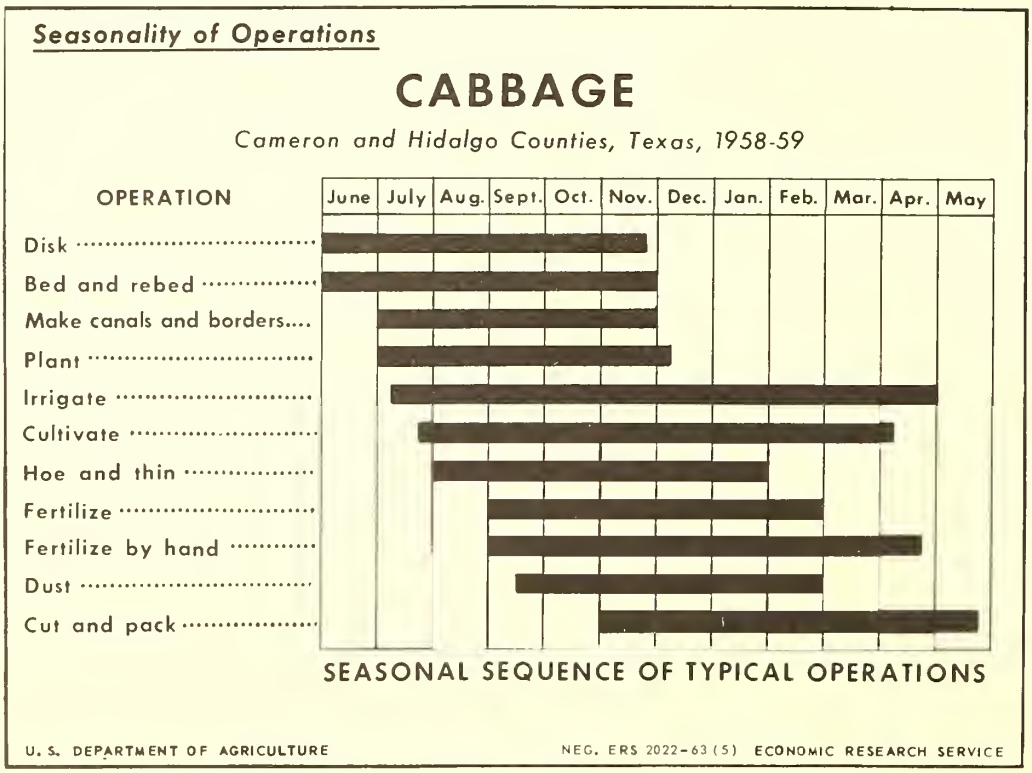

Figure 4

Table A.--Cabbage: Materials used and contract work hired, averages for 2,320 acres on 113 farms, Cameron and Hidalgo Counties, Texas, 1958-59

Item	Unit	Units per acre covered	Price per unit	Cost per acre covered	Percentage of total acreage covered	Cost per acre, total acreage
		Number	Dollars	Dollars	Percent	Dollars
Materials used:						
Seed	Lb.	1.6	3.36	5.38	94	5.06
Plants	Thous.	15.8	1.38	21.80	6	1.31
Fertilizer:						
Liquid, 81-0-0	Gal.	21.9	.44	9.64	5	.48
20-20-0	Cwt.	1.8	4.83	8.69	5	.43
21-0-0	Cwt.	3.8	4.39	16.68	58	9.67
Irrigation	Applic.	4.3	1.84	7.91	100	7.91
Spray materials 1/	Gal.	5.7	2.77	15.79	50	7.90
Dust materials 1/	Lb.	84.8	.129	10.94	60	6.56
Total	---	---	---	---	---	2/ 39.32
Contract work hired:						
Plane dusting includes dust	Applic.	4.8	3.24	15.55	16	2.49
Plane dusting, application only	Applic.	3.0	1.24	3.72	1	.04
Plane spraying, includes spray	Applic.	3.0	2.78	8.34	7	.58
Spraying, 8-row sprayer, includes materials	Applic.	3.3	3.54	11.68	2	.23
Total	---	---	---	---	---	3.34
Total materials and contract work	---	---	---	---	---	3/ 42.66

1/ Assorted materials.
2/ Excludes container costs which were not obtained.
3/ Average yield per acre -- 7.6 tons. Average cost of materials and contract work per ton -$5.61.

Table B.--Cabbage: Labor, power, and machinery used in producing and harvesting, by operation, averages for 2,320 acres on 113 farms, Cameron and Hidalgo Counties, Texas, 1958-59

Operation	Type and size of equipment	Time per acre, once over		Times over, acreage covered	Percentage of total acreage covered	Time per acre, total acreage	
		Man	Power			Man	Power
		Hours	Hours	Number	Percent	Hours	Hours
Preharvest:							
Cut stalks	6-foot stalk cutter	0.4	0.4	1.0	2	1/	1/
Plow	2-bottom disk	.9	.9	1.3	44	0.5	0.5
Disk	7-foot tandem disk	.7	.7	1.5	98	1.0	1.0
Float	10-foot landplane	.8	.8	1.1	12	.1	.1
Bed and re-bed	4-row bedder	.6	.6	2.1	92	1.2	1.2
Plant	4-row seeder	.8	.6	1.0	86	.7	.5
Pull plants and transplant	---	44.0	---	1.0	8	3.5	---
Transplant	---	33.6	---	1.0	6	2.0	---
Make canals and borders	Border disk	.8	.8	4.0	80	2.6	2.6
Irrigate 2/	---	3.1	---	4.3	100	13.3	---
Cultivate	2-row cultivator	1.1	1.1	3.5	100	3.8	3.8
Cultivate and fertilize	2-row cult./attach.	3.4	3.4	1.3	7	.3	.3
Fertilize	4-row distributor	.6	.4	1.3	51	.4	.3
Fertilize by hand	---	3.7	---	3.0	54	6.0	---
Spray	8-row boom sprayer	.3	.2	3.9	44	.5	.3
Spray (custom)	Plane	1/	1/	3.0	7	1/	1/
Spray (custom)	8-row boom sprayer	.3	.2	3.3	2	1/	1/
Dust	8-row duster	.3	.2	3.5	51	.5	.4
Dust (custom)	Plane	.1	.1	4.7	2	1/	1/
Dust by hand	---	3.9	---	1.7	5	.3	---
Hoe and thin	---	13.7	---	2.3	70	22.1	---
Thin and weed	---	25.2	---	1.1	32	8.9	---
Total	---	---	---	---	---	67.7	11.0
Harvest:							
Cut and pack 3/	---	10.6	---	3.9	4/ 67	27.7	---
Total preharvest and harvest	---	---	---	---	---	5/ 95.4	11.0

1/ Less than 0.05 hour.
2/ Includes applying liquid fertilizers and maintenance of borders.
3/ Inputs for loading and hauling were not available.
4/ One-third of the total acreage was sold unharvested. Harvesting was performed by buyers' crews.
5/ Average yield per acre -7.6 tons. Average labor and power used per ton - 12.6 hours and 1.4 hours, respectively.

Table C.--Cabbage: Usual labor and power inputs, Cameron and Hidalgo Counties, Texas, 1958-59

Operation	Times over	Time per acre, once over		Time per acre, total	
		Man	Power	Man	Power
	Number	Hours	Hours	Hours	Hours
Disk	2	0.7	0.7	1.4	1.4
Bed and re-bed	2	.6	.6	1.2	1.2
Plant	1	.8	.6	.8	.6
Make canals and borders	4	.8	.8	3.2	3.2
Irrigate	4	3.1	---	12.4	---
Cultivate	4	1.1	1.1	4.4	4.4
Fertilize	1	.6	.4	.6	.4
Fertilize by hand	3	3.7	---	11.1	---
Dust	4	.3	.2	1.2	.8
Hoe and thin	2	13.7	---	27.4	---
Cut and pack	4	10.6	---	42.4	---
Total	---	---	---	106.1	12.0

Table D.--Cabbage: Distribution of workers performing specified operations, by type of worker, 113 farms, Cameron and Hidalgo Counties, Texas, 1958-59

Operation	Type of worker				
	Operator and unpaid family	Year-round hired	Local seasonal	Domestic migratory	Foreign
	Percent	Percent	Percent	Percent	Percent
Cut stalks	33	0	67	0	0
Plow	62	20	11	0	7
Harrow	49	23	12	5	11
Float	25	25	19	0	31
Bed and rebed	52	32	8	0	8
Plant	50	50	0	0	0
Pull plants and transplant	12	0	74	14	0
Transplant	0	0	85	15	0
Make canals and borders	0	20	80	0	0
Irrigate	28	27	22	9	14
Cultivate	45	24	16	4	11
Cultivate and fertilize	3	15	63	0	19
Fertilize	38	17	20	0	25
Fertilize by hand	38	42	7	12	1
Spray	40	40	14	0	6
Spray by hand	100	0	0	0	0
Dust	59	38	0	3	0
Dust by hand	41	31	21	7	0
Hoe and thin	8	0	67	6	19
Thin and weed	2	5	33	4	56
Cut and pack	5	1	62	2	30

Figure 5 and tables A, B, C, and D were prepared from information covering production of carrots for the fresh market on 2,790 acres on 127 farms in 1958-59. The average yield per acre of topped carrots was 4.95 tons.

Tractors were the chief source of power on these farms. Unless otherwise indicated, they were used for operations listed. Information as to size of tractor was not obtained, but size of equipment used would indicate the average tractor to be a 3-plow tractor with a drawbar horsepower rating of 20 to 30.

Most of carrot acreage had been planted to cotton previously, and apparently growers considered the ground had considerable residual fertilizer, because less than half of the acreage was fertilized for the carrot crop. Where fertilizer was used, the applications were light.

The weedkiller, naptha, was applied to nearly 40 percent of the acreage. Use of this herbicide materially reduced the need for hand hoeing and weeding.

All farmers sold their carrots in the field and thus entailed no hauling inputs. On one-third of the acreage, farmers sold their carrots plowed out but not topped. On 44 percent of the acreage, farmers hired crews to pull and top by hand. Carrots on the remaining 23 percent of the acreage were sold still growing and were harvested by buyers' crews.

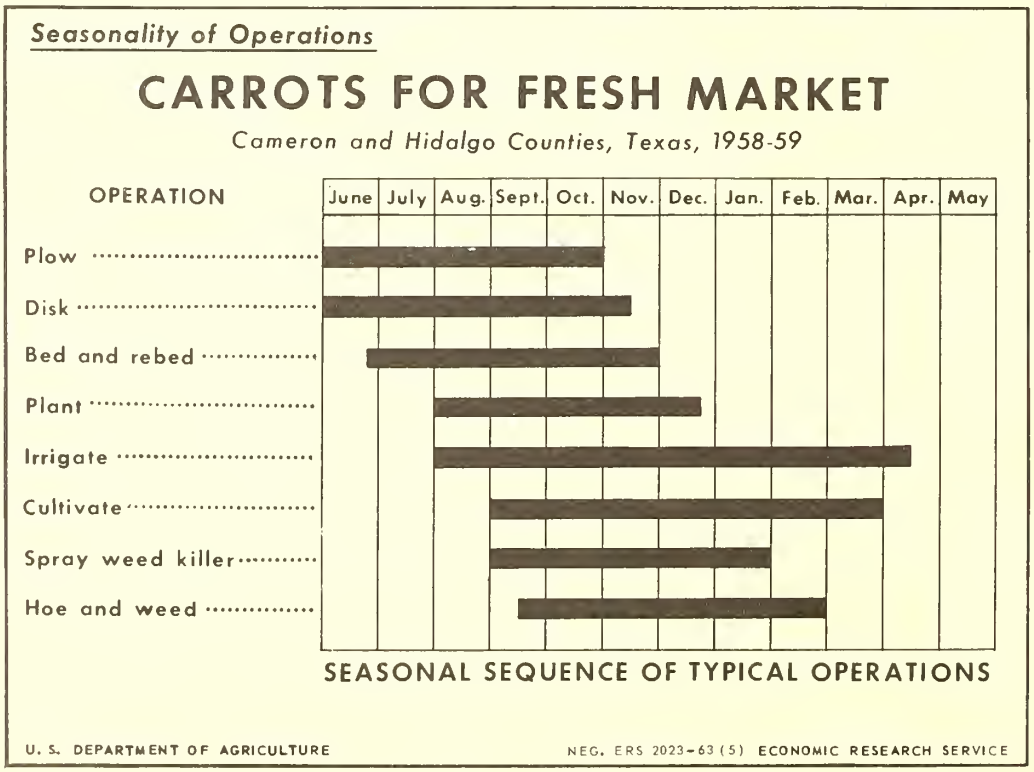

Figure 5

Table A.--Carrots: Materials used and contract work hired, averages for 2,790 acres on 127 farms, Cameron and Hidalgo Counties, Texas, 1958-59

Item	Unit	Units per acre covered	Price per unit	Cost per acre covered	Percentage of total acreage covered	Cost per acre, total acreage
		Number	Dollars	Dollars	Percent	Dollars
Materials used:						
Seed	Lb.	2.1	1.90	3.99	100	3.99
Fertilizer, 33-0-0	Cwt.	1.9	4.35	8.26	32	2.64
Fertilizer, liquid, 82-0-0	Gal.	9.3	.61	5.67	1	.06
Fertilizer, urea	Lb.	11.1	.044	.49	3	.01
Weedkiller, naptha	Gal.	48.3	.21	10.14	37	3.75
Pesticides, assorted	Acre	1.5	3.15	4.72	13	.61
Dust, DDT	Lb.	50.0	.078	3.90	2	.08
Irrigation	Acre	2.5	1.70	4.25	100	4.25
Total	---	---	---	---	---	15.39
Contract work hired:						
Plant, seed not included	Acre	1.0	1.86	1.86	4	.07
Spray naptha with ground sprayer, naptha included	Acre	1.3	14.35	18.66	10	1.87
Cultivate	Acre	1.0	5.00	5.00	1	.05
Fertilize by plane, urea included	Acre	1.0	2.37	2.37	7	.17
Spray by plane, materials included	Acre	1.0	2.33	2.33	3	.07
Dust by plane, materials included	Acre	3.0	1.50	4.50	5	.22
Spray by boom sprayer, materials included	Acre	2.1	2.82	5.92	2	.12
Total	---	---	---	---	---	2.57
Total materials and contract work	---	---	---	---	---	1/ 17.96

1/ Average yield per acre - 4.95 tons. Average cost of materials and contract work per ton - $3.63.

Table B.--Carrots: Labor, power, and machinery used in producing and harvesting, averages for 2,790 acres on 127 farms, Cameron and Hidalgo Counties, Texas, 1958-59

Operation	Type and size of equipment	Time per acre, once over		Times over, acreage covered	Percentage of total acreage covered	Time per acre, total acreage	
		Man	Power			Man	Power
		Hours	Hours	Number	Percent	Hours	Hours
Preharvest:							
Cut stalks	2-bed chopper	0.6	0.6	1.0	17	0.1	0.1
Plow	3-bot. disk plow	1.1	1.1	1.2	87	1.1	1.1
Disk	8-foot tandem	.8	.8	1.9	87	1.3	1.3
Float	10-foot landplane	.6	.6	1.1	32	.2	.2
List	2-row lister	.8	.8	1.6	16	.2	.2
Roll	12-foot roller	.5	.5	1.0	11	.1	.1
Bed and rebed	2-bed lister	.7	.7	1.4	88	.9	.9
Plant	2-bed seeder	1.0	.8	1.0	96	1.0	.8
Plant (custom)	2-bed seeder	1.0	.8	1.0	4	1/	1/
Irrigate	---	3.1	---	2.5	100	7.8	---
Cultivate	2-bed cultivator	.9	.9	3.6	96	3.1	3.1
Cultivate (custom)	2-bed cultivator	.7	.7	1.0	1	1/	1/
Cultivate and fertilize	2-bed cult./attach.	1.0	1.0	1.0	5	.1	.1
Cultivate by hand	---	4.5	---	3.1	2	.3	---
Fertilize 2/	2-bed distributor	1.4	1.3	1.1	24	.4	.3
Fertilize by hand	---	3.4	---	1.1	3	.1	---
Spray weedkiller and pesticides	8-bed boom sprayer	.5	.5	1.4	50	.4	.4
Spray (custom)	plane	1/	1/	1.0	3	1/	1/
Spray (custom)	boom sprayer	.5	.5	2.1	2	1/	1/
Fertilize (custom)	plane	1/	1/	1.0	7	1/	1/
Dust	2-bed duster	1.0	1.0	1.7	2	1/	1/
Dust (custom)	plane	1/	1/	3.0	5	1/	1/
Hoe and weed	---	15.1	---	1.2	70	12.7	---
Weed and thin	---	75.0	---	1.0	2	1.5	---
Total	---	---	---	---	---	31.3	8.6
Harvest:							
Plow out	2-bed carrot plow	1.2	1.2	1.0	33	.4	.4
Pull and top by hand	---	62.9	---	1.0	44	27.7	---
Total	---	---	---	---	---	28.1	.4
Total preharvest and harvest	---	---	---	---	---	3/ 59.4	3/ 9.0

1/ Less than 0.05 hour. 2/ Fertilizer was applied in irrigation water on 5 percent of the acreage.
3/ Average yield per acre - 4.95 tons. Average man and power hours per ton - 12.0 hours and 1.8 hours, respectively.

Table C.--Carrots: Usual labor and power inputs, Cameron and Hidalgo Counties, Texas, 1958-59

Operation	Times over	Time per acre, once over		Time per acre, total	
		Man	Power	Man	Power
	Number	Hours	Hours	Hours	Hours
Plow	1	1.1	1.1	1.1	1.1
Disk	2	.8	.8	1.6	1.6
Bed and rebed	1	.7	.7	.7	.7
Plant	1	1.0	.8	1.0	.8
Irrigate	3	3.1	---	9.3	---
Cultivate	4	.9	.9	3.6	3.6
Hoe and weed	1	15.1	---	15.1	---
Spray weedkiller	1	.5	.5	.5	.5
Total	---	---	---	32.9	8.3

Table D.--Carrots: Distribution of workers performing specified operations, by type of worker, 127 farms, Cameron and Hidalgo Counties, Texas, 1958-59

Operation	Type of worker				
	Operator and unpaid family	Year-round hired	Local seasonal	Domestic migratory	Foreign
	Percent	Percent	Percent	Percent	Percent
Cut stalks	90	10	0	0	0
Plow	45	22	16	1	16
Disk	43	18	17	0	22
Float	37	27	16	0	20
List	24	41	6	0	29
Roll	33	17	17	0	33
Bed and rebed	54	14	13	0	19
Plant 1/	45	19	18	0	18
Irrigate	33	13	25	0	29
Cultivate 1/	45	18	16	0	21
Cultivate and fertilize	20	60	20	0	0
Cultivate by hand	25	50	0	0	25
Fertilize 1/	12	21	29	0	38
Fertilize by hand	34	33	0	0	33
Spray 1/	53	19	19	0	9
Dust 1/	75	25	0	0	0
Hoe and weed	15	1	49	0	35
Weed and thin	0	0	47	0	53
Plow out	37	6	3	0	54
Pull and top by hand	5	2	73	0	20

1/ Excludes custom work.

Data presented in figure 6 and tables A, B, C, and D are based on information obtained covering production of sweet corn for the fresh market on 637 acres on 17 farms in 1958-59. The average yield per acre was 28.2 hundredweight.

Tractors were the chief source of power on these farms. Unless otherwise indicated, they were used for operations listed. The size of tractor was not obtained, but considering the size of equipment used, it appears that the average tractor was about a 2-plow tractor with a drawbar horsepower rating of 15 to 20.

The acreage of sweet corn grown for the fresh market in the Lower Rio Grande Valley has declined by about a third over the past ten years. It has not brought returns to growers that are favorable in relation to returns from alternative crops. Current fertilization practices indicate the skepticism of growers. Only about one-fourth of the acreage is fertilized, yet corn has relatively high fertility requirements. On most farms, however, corn followed heavily fertilized cotton and may have been able to obtain some residual fertilizer.

In general, most growers harvested sweet corn with their own crews and sold sacked corn to the produce sheds. Local workers were predominant in the picking crews.

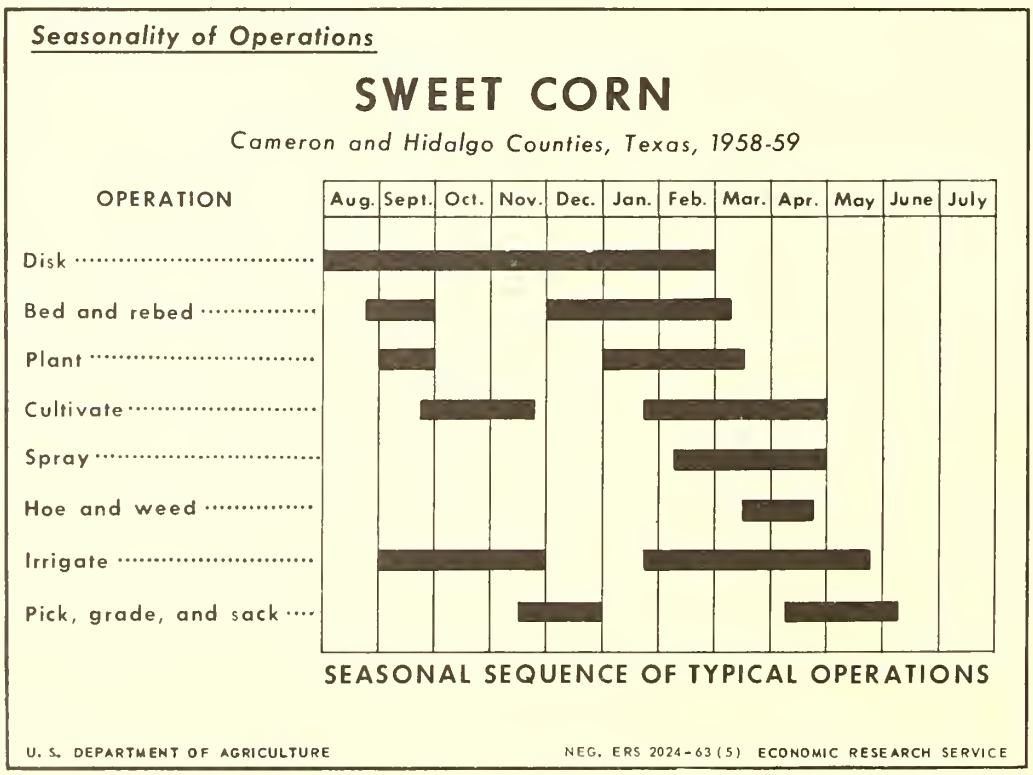

Figure 6

Table A.--Sweet Corn: Materials used and contract work hired, averages for 637 acres on 17 farms, Cameron and Hidalgo Counties, Texas, 1958-59

Item	Unit	Units per acre covered	Price per unit	Cost per acre covered	Percentage of total acreage covered	Cost per acre, total acreage
		Number	Dollars	Dollars	Percent	Dollars
Materials used:						
Seed	Lb.	20	0.43	8.60	100	8.60
Fertilizer, 16-20-0	Cwt.	2.0	4.50	9.00	27	2.43
Spray, DDT	Gal.	15.1	2.50	37.75	74	27.94
Dust, 10% DDT	Lb.	47.8	.074	3.54	6	.21
Irrigation water	Applic.	2	1.61	3.22	97	3.12
Sacks	Each	60	.15	9.00	78	7.02
Total	---	---	---	---	---	49.32
Contract work hired:						
Dust by plane, dust included	Acre	2.2	1.13	2.49	5	.12
Total	---	---	---	---	---	.12
Total materials and contract work	---	---	---	---	---	1/ 49.44

1/ Average yield per acre - 28.2 cwt. Average cost of materials and contract work per cwt. - $1.75.

Table B.--Sweet Corn: Labor, power, and machinery used in producing and harvesting, by operation, averages for 637 acres on 17 farms, Cameron and Hidalgo Counties, Texas, 1958-59

Operation	Type and size of equipment	Time per acre, once over		Times over, acreage covered	Percentage of total acreage covered	Time per acre, total acreage	
		Man	Power			Man	Power
		Hours	Hours	Number	Percent	Hours	Hours
Preharvest:							
Plow	2-bot. disk	1.2	1.2	1.0	22	0.3	0.3
Disk	8-foot tandem	.6	.6	1.4	95	.8	.8
Float	8-foot float	3.6	3.6	1.0	2	.1	.1
Drag	8-foot drag	2.9	2.9	1.0	2	.1	.1
List and fertilize	2-row lister/attach.	1.1	1.1	1.0	2	1/	1/
Bed and re-bed	2-bed bedder	.6	.6	2.4	91	1.3	1.3
Plant	4-row seeder	.7	.4	1.0	100	.7	.4
Fertilize	4-row distributor	.4	.4	1.0	9	1/	1/
Fertilize by hand	---	11.6	---	1.9	5	1.1	---
Cultivate	4-row cultivator	1.3	1.3	1.5	95	1.9	1.9
Cultivate and fertilize	4-row cult./attach.	1.4	1.0	1.0	11	.2	.1
Spray	8-row boom	.2	.2	1.1	74	.2	.2
Weed	---	7.6	---	1.0	2	.2	---
Hoe and weed	---	24.1	---	1.0	70	16.9	---
Dust	8-row duster	.8	.8	2.0	2	1/	1/
Dust (custom)	plane	1/	1/	2.0	5	1/	1/
Dust by hand	---	25.9	---	2.0	4	2.1	---
Irrigate	---	3.4	---	2.0	97	6.6	---
Total	---	---	---	---	---	32.5	5.2
Harvest:							
Pick, grade, and pack by hand	---	15.3	---	3.0	78	35.8	2/
Total	---	---	---	---	---	35.8	---
Total preharvest and harvest	---	---	---	---	---	3/ 68.3	3/ 5.2

1/ Less than 0.05 hour. 2/ Hauled from field by buyer.
3/ Average yield per acre — 28.2 cwt. Average labor and power used per cwt. — 2.4 hours and 0.2 hour, respectively.

Table C.--Sweet Corn: Usual labor and power inputs, Cameron and Hidalgo Counties, Texas, 1958-59

Operation	Times over	Time per acre, once over		Time per acre, total	
		Man	Power	Man	Power
	Number	Hours	Hours	Hours	Hours
Disk	1	0.6	0.6	0.6	0.6
Bed and rebed	2	.6	.6	1.2	1.2
Plant	1	.7	.4	.7	.4
Cultivate	2	1.3	1.3	2.6	2.6
Spray	1	.2	.2	.2	.2
Hoe and weed	1	24.1	---	24.1	---
Irrigate	2	3.4	---	6.8	---
Pick, grade, and sack	3	15.3	---	45.9	---
Total	---	---	---	82.1	5.0

Table D.--Sweet Corn: Distribution of workers performing specified operations, by type of worker, 17 farms, Cameron and Hidalgo Counties, Texas, 1958-59

Operation	Type of worker			
	Operator and unpaid family	Year-round hired	Local seasonal	Foreign
	Percent	Percent	Percent	Percent
Plow	65	7	14	14
Disk	42	26	16	16
Float	100	0	0	0
Drag	100	0	0	0
List and fertilize	0	0	100	0
Bed and rebed	48	48	0	4
Plant	56	24	16	4
Fertilize	75	0	0	25
Fertilize by hand	6	0	94	0
Cultivate	67	0	33	0
Cultivate and fertilize	43	35	13	9
Spray	40	40	20	0
Weed	100	0	0	0
Hoe and weed	1	0	99	0
Dust 1/	100	0	0	0
Dust by hand	0	0	100	0
Irrigate	31	38	22	9
Cut, grade, and sack	36	0	52	12

1/ Excludes custom operations.

Data presented in figure 7 and tables A, B, C, and D are based on information obtained covering production of lettuce for the fresh market on 355 acres on 11 farms in 1958-59. The average yield per acre was 8.47 tons.

Tractors were the chief source of power on these farms. Unless otherwise indicated, they were used for operations listed. Information on size of tractor was not obtained, but size of equipment used indicates these tractors to be 2- and 3-plow tractors with drawbar horsepower ratings of 15 to 30.

While all lettuce was irrigated, only about one-third of the acreage was planted on beds. The usual practice was to plant on level ground. Then cultivation between the rows, in addition to controlling weeds, provided shallow furrows for the distribution of irrigation water.

Harvesting crews, hired by the farmer, cut and packed lettuce produced on 75 percent of the entire acreage. The remaining acreage was sold growing in the field and was harvested by the purchaser. Lettuce is so commonly sold in the field in cartons provided by the buyer, that not one of the eleven growers reported the purchase price of cartons.

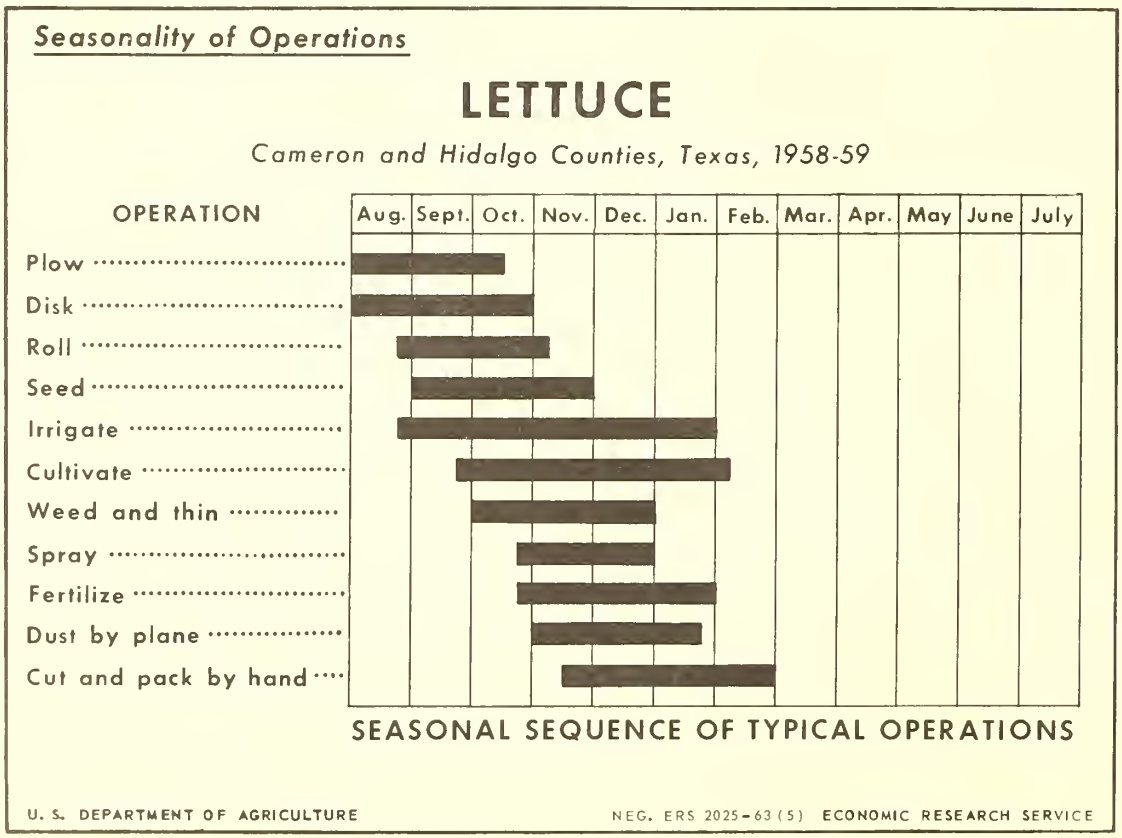

Figure 7

Table A.--Lettuce: Materials used and contract work hired, averages for 355 acres on 11 farms, Cameron and Hidalgo Counties, Texas, 1958-59

Item	Unit	Units per acre covered	Price per unit	Cost per acre covered	Percentage of total acreage covered	Cost per acre, total acreage
		Number	Dollars	Dollars	Percent	Dollars
Materials used:						
Seed	Lb.	1.1	4.97	5.47	100	5.47
Fertilizer, 12-12-6	Cwt.	4.1	4.28	17.55	48	8.42
Fertilizer, 15-15-20	Gal.	17.5	.51	8.92	51	4.55
Spray, DDT and parathion	Applic.	1.8	2.62	4.72	80	3.78
Dust, DDT toxaphene	Lb.	160	.15	24.00	1	.24
Irrigation fees	Applic.	3.3	1.82	6.01	100	6.01
Total 1/	---	---	---	---	---	28.47
Contract work hired:						
Spray, tractor and materials	Applic.	2.0	4.00	8.00	1	.08
Dust, plane and materials	Applic.	5.6	1.60	8.96	75	6.72
Total	---	---	---	---	---	6.80
Total materials and contract work	---	---	---	---	---	2/ 35.27

1/ Buyer furnishes crates.

2/ Average yield per acre - 8.47 tons. Average cost of materials and contract work per acre - $4.16.

Table B.--Lettuce: Labor, power, and machinery used in producing and harvesting, by operation, averages for 355 acres on 11 farms, Cameron and Hidalgo Counties, Texas, 1958-59

Operation	Type and size of equipment	Time per acre, once over		Times over, acreage covered	Percentage of total acreage covered	Time per acre, total acreage	
		Man	Power			Man	Power
		Hours	Hours	Number	Percent	Hours	Hours
Preharvest:							
Cut stalks	6-foot shredder	1.0	1.0	1.0	3	1/	1/
Plow	3-bot. disk	.9	.9	1.0	70	0.6	0.6
Disk	12-foot tandem	.5	.5	2.1	77	.8	.8
List	4-row lister	.6	.6	1.0	46	.3	.3
List and fertilize	4-row lister/attach.	.8	.6	1.0	17	.1	.1
Float	10-foot float	.7	.7	1.0	8	.1	.1
Roll	10-foot roller	.8	.8	1.0	54	.4	.4
Drag	8-foot plank	1.3	1.3	1.0	4	.1	.1
Bed and rebed	4-row bedder	.7	.7	1.4	35	.3	.3
Make borders	6-foot border disk	1.0	.6	1.0	5	.1	1/
Check borders	---	1.0	---	1.0	5	.1	---
Seed	4-row seeder	1.1	.7	1.0	100	1.1	.7
Irrigate	---	2.3	---	3.3	100	7.6	---
Cultivate	2-row cultivator	.7	.7	4.6	100	3.2	3.2
Cultivate and fertilize	2-row cult./attach.	.8	.7	2.0	8	.1	.1
Fertilize	2-row distributor	.6	.6	1.1	61	.4	.4
Fertilize by hand	---	3.0	---	1.0	10	.3	---
Weed and thin	---	11.2	---	1.2	93	12.5	---
Block and hoe	---	14.4	---	1.0	32	4.6	---
Spray	16-row boom	.2	.2	1.8	80	.3	.3
Spray (custom)	Boom sprayer	.2	.2	2.0	1	1/	1/
Dust	8-row duster	.2	.2	4.0	1	1/	1/
Dust (custom)	Plane	1/	1/	5.6	75	.1	.1
Total	---	---	---	---	---	33.1	7.5
Harvest:							
Cut and pack by hand	---	25.2	---	1.7	68	29.0	---
Cut by hand, convey by machine, pack by hand	Lettuce harvester	23.6	1.6	1.0	6	1.4	.1
Total 2/	---	---	---	---	---	30.4	.1
Total preharvest and harvest	---	---	---	---	---	3/ 63.5	3/ 7.6

1/ Less than 0.05 hour. 2/ The remaining 26 percent of the acreage was harvested by the buyer, production from the entire acreage was hauled from the field in the buyer's trucks.

3/ Average yield per acre - 8.47 tons. Average labor and power used per ton - 7.5 hours and 0.9 hour, respectively.

Table C. --Lettuce: Usual labor and power inputs, Cameron and Hidalgo Counties, Texas, 1958-59

Operation	Times over	Time per acre, once over		Time per acre, total	
		Man	Power	Man	Power
	Number	Hours	Hours	Hours	Hours
Plow	1	0.9	0.9	0.9	0.9
Disk	2	.5	.5	1.0	1.0
Roll	1	.8	.8	.8	.8
Seed	1	1.1	.7	1.1	.7
Irrigate	3	2.3	---	6.9	---
Cultivate	5	.7	.7	3.5	3.5
Fertilize	1	.6	.6	.6	.6
Weed and thin	1	11.2	---	11.2	---
Spray	2	.2	.2	.4	.4
Dust by plane (custom)	6	1/	1/	.1	.1
Cut and pack by hand	2	25.2	---	50.4	---
Total	---	---	---	76.9	8.0

1/ Less than 0.05 hour.

Table D. --Lettuce: Distribution of workers performing specified operations, by type of worker, 11 farms, Cameron and Hidalgo Counties, Texas, 1958-59

Operation	Type of worker		
	Operator and unpaid family	Local seasonal	Foreign
	Percent	Percent	Percent
Cut stalks	100	0	0
Plow	27	27	46
Disk	40	30	30
List	0	50	50
List and fertilize	100	0	0
Float	0	0	100
Roll	0	100	0
Drag	0	0	100
Bed and rebed	56	11	33
Make borders	0	0	100
Check borders	0	0	100
Seed	44	19	37
Irrigate	18	41	41
Cultivate	25	33	42
Cultivate and fertilize	0	0	100
Fertilize	33	50	17
Fertilize by hand	0	0	100
Weed and thin	5	68	27
Block and hoe	0	100	0
Spray 1/	50	30	20
Dust 1/	67	33	0

1/ Excludes custom operations.

Data in figure 8 and tables A, B, C, and D are based on information covering the production and harvesting of 135 acres of okra grown for the fresh market on 15 farms in 1958-59. The average yield per acre was 2,700 pounds.

Tractors were the chief source of power on these farms. Unless otherwise indicated, they were used for operations listed. Size of tractor was not obtained in this survey, but size of equipment used indicates that the average tractor was about a 2-plow tractor with a drawbar horsepower rating of 15 to 20.

Okra is very susceptible to frost and grows best during hot weather. In the Lower Rio Grande Valley it is planted from early in December to mid-March, with the bulk of the acreage being planted late in January and after. Early plantings frequently are killed by frost and must be replanted.

Harvesting of okra was performed on an every-other-day basis, and averaged 19.2 times per acre. Okra plants flower one at a time, and the pods ripen rapidly. If not harvested within eight or nine days after flowering, the pod becomes woody and unpalatable. Most harvest crews were paid on a time basis as this crop must be cut and packed very carefully to prevent bruising and discoloration. Workers paid on a piece-rate basis tend to be less careful in handling such a tender crop.

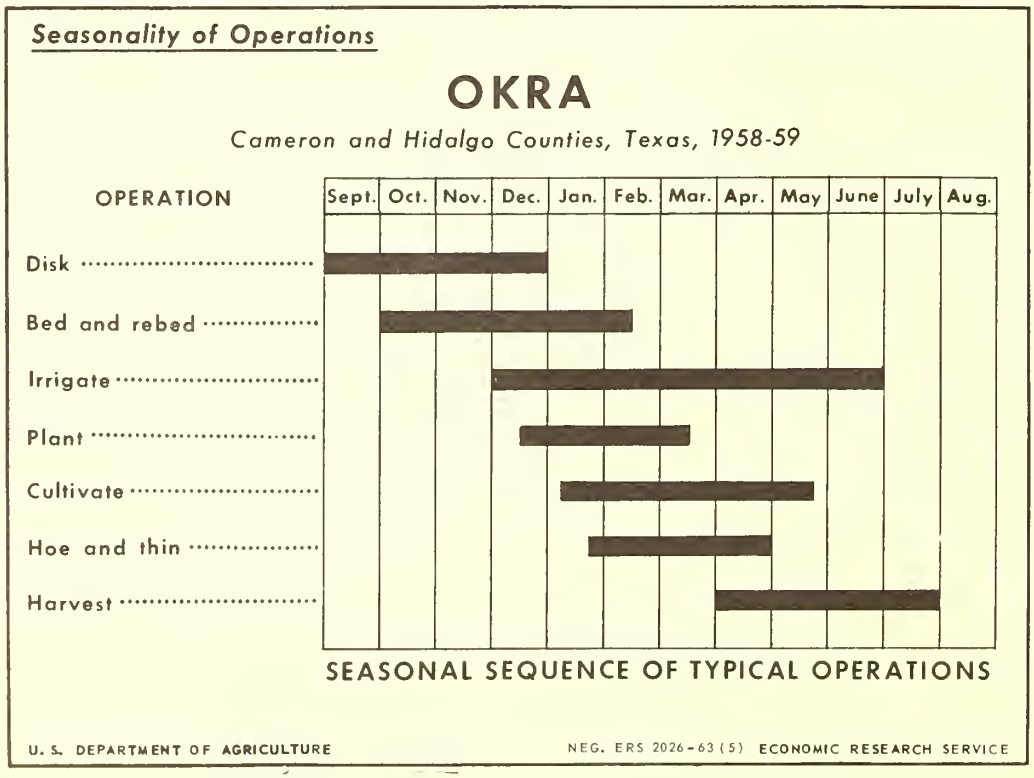

Figure 8

Table A.--Okra: Materials used, averages for 135 acres on 15 farms, Cameron and Hidalgo Counties, Texas, 1958-59

Materials used	Unit	Units per acre covered	Price per unit	Cost per acre covered	Percentage of total acreage covered	Cost per acre, total acreage
		Number	Dollars	Dollars	Percent	Dollars
Seed	Lb.	14.2	0.59	8.38	100	8.38
Fertilizer, 21-0-0	Cwt.	2.0	4.60	9.20	18	1.66
Dust, parathion-toxaphene	Lb.	73	.07	5.11	31	1.58
Spray, parathion	Qt.	3.9	2.58	10.06	47	4.73
Irrigation fees	Applic.	3.3	1.97	6.50	93	6.04
Total 1/	---	---	---	---	---	2/ 22.39

1/ Excludes container costs which were not obtained.
2/ Average yield per acre - 2,700 pounds. Average cost of materials used per hundredweight - $0.83.

Table B.--Okra: Labor, power, and machinery used in producing and harvesting, by operation, averages for 135 acres on 15 farms, Cameron and Hidalgo Counties, Texas, 1958-59

Operation	Type and size of equipment	Time per acre, once over		Times over, acreage covered	Percentage of total acreage covered	Time per acre, total acreage	
		Man	Power			Man	Power
		Hours	Hours	Number	Percent	Hours	Hours
Preharvest:							
Plow	3-disk plow	1.8	1.8	1.0	35	0.6	0.6
Disk	7-foot tandem	1.2	1.2	1.9	93	2.1	2.1
List	4-row lister	1.2	1.2	2.9	46	1.6	1.6
Level	10-foot landplane	1.3	1.3	1.0	6	.1	.1
Bed and rebed	4-row bedder	1.2	1.2	1.8	65	1.4	1.4
Irrigate	---	1.7	---	3.3	93	5.2	---
Plant	4-row seeder	1.2	1.2	1.1	100	1.3	1.3
Fertilize	2-row distributor	1.1	1.1	1.0	13	.1	.1
Fertilize by hand	---	1.6	---	1.0	11	.2	---
Cultivate	4-row cultivator	1.1	1.1	3.9	100	4.3	4.3
Spray	2-row boom	.6	.6	3.4	40	.8	.8
Spray by hand	---	1.0	---	1.0	7	.1	---
Hoe and thin	---	12.3	---	2.0	100	24.6	---
Dust	2-row duster	.6	.6	2.4	19	.3	.3
Dust by hand	---	1.4	---	3.2	12	.5	---
Total	---	---	---	---	---	43.2	12.6
Harvest:							
Cut and pack by hand	---	8.0	---	19.2	87	133.6	---
Total 1/	---	---	---	---	---	133.6	---
Total preharvest and harvest	---	---	---	---	---	2/ 176.8	2/ 12.6

1/ Does not include loading or hauling inputs, nor harvesting inputs on the 13 percent of the acreage which was harvested by buyers.

2/ Average yield per acre - 2,700 pounds average labor and power used per hundredweight - 6.55 hours and and 0.47 hour, respectively.

Table C.--Okra: Usual labor and power inputs, Cameron and Hidalgo Counties, Texas, 1958-59

Operation	Times over	Time per acre, once over		Time per acre, total	
		Man	Power	Man	Power
	Number	Hours	Hours	Hours	Hours
Disk	2	1.2	1.2	2.4	2.4
Bed and rebed	2	1.2	1.2	2.4	2.4
Irrigate	3	1.7	---	5.1	---
Plant	1	1.2	1.2	1.2	1.2
Cultivate	4	1.1	1.1	4.4	4.4
Hoe and thin	2	12.3	---	24.6	---
Harvest	19	8.0	---	152.0	---
Total	---	---	---	192.1	10.4

Table D.--Okra: Distribution of workers performing specified operations, by type of worker, 15 farms, Cameron and Hidalgo Counties, Texas, 1958-59

Operation	Type of worker			
	Operator and unpaid family	Year-round hired	Local seasonal	Foreign
	Percent	Percent	Percent	Percent
Plow	67	16	0	17
Disk	57	7	22	14
List	43	14	14	29
Level	0	100	0	0
Bed and rebed	38	12	25	25
Irrigate	33	7	27	33
Plant	53	7	20	20
Fertilize	0	50	0	50
Fertilize by hand	33	33	34	0
Cultivate	53	7	20	20
Spray	50	0	50	0
Spray by hand	100	0	0	0
Hoe and thin	15	14	57	14
Dust	0	50	0	50
Dust by hand	75	0	25	0
Cut and pack by hand	42	0	16	42

Data in figure 9 and tables A, B, C, and D were prepared from information covering production of dry onions for the fresh market on 596 acres on 19 farms in 1958-59. The average yield per acre in 50-pound sacks was 256 sacks.

Tractors were the chief source of power on these farms. Unless otherwise indicated, they were used for operations listed. Size of tractor was not obtained in the survey, but size of equipment used indicates the average tractor to be a 3-plow tractor with a drawbar horsepower rating of 20 to 30.

Onions require a fine seedbed that is firmly packed. Germination of seed is poor in a loose, poorly prepared seedbed. More than half of the acreage surveyed was rolled after beds were prepared. On 18 percent of the acreage, chemical weedkillers were used in an attempt to reduce labor inputs.

On nearly two-thirds of the acreage onions were sold standing in the field. The remainder was pulled and topped by farm crews.

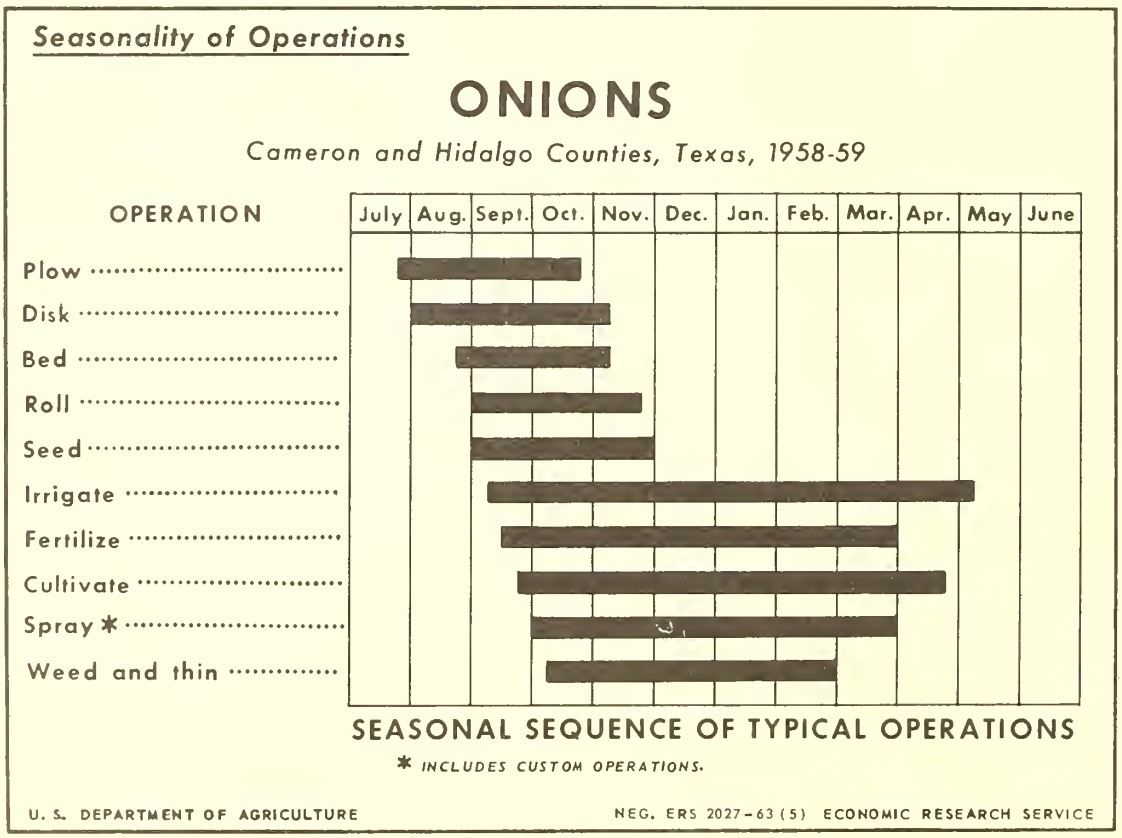

Figure 9

Table A.--Dry onions: Materials used and contract work hired, averages for 596 acres on 19 farms, Cameron and Hidalgo Counties, Texas, 1958-59

Item	Unit	Units per acre covered	Price per unit	Cost per acre covered	Percentage of total acreage covered	Cost per acre, total acreage
		Number	Dollars	Dollars	Percent	Dollars
Materials used:						
Seed	Lb.	2.1	6.99	14.68	100	14.68
Fertilizer, 12-24-12	Cwt.	3.2	4.76	15.23	66	10.05
Fertilizer, liquid 8-16-8	Gal.	42	.63	26.46	51	13.49
Irrigation fees	Applic.	3.4	1.75	5.95	100	5.95
Weedkillers, assorted	Gal.	13.1	.58	7.60	18	1.37
Fungicides, insecticides	Gal.	6.1	1.77	10.80	56	6.05
Dust, mangate	Lb.	30	1.00	30.00	3	.90
Total	---	---	---	---	---	52.49
Contract work hired:						
Spray by plane, includes materials	Applic.	2.6	5.82	15.13	45	6.81
Spray by boom sprayer, includes materials	Applic.	1.4	4.79	6.71	15	1.01
Total	---	---	---	---	---	7.82
Total materials and contract work	---	---	---	---	---	1/ 60.31

1/ Average yield per acre - 256 50-pound sacks. Average cost of materials and contract work per sack - $0.24.

Table B.--Dry onions: Labor, power, and machinery used in producing and harvesting, by operation, averages for 596 acres on 19 farms, Cameron and Hidalgo Counties, Texas, 1958-59

Operation	Type and size of equipment	Time per acre, once over		Times over, acreage covered	Percentage of total acreage covered	Time per acre, total acreage	
		Man	Power			Man	Power
		Hours	Hours	Number	Percent	Hours	Hours
Preharvest:							
Plow	3-bottom disk	1.1	1.1	1.3	60	0.9	0.9
Disk	10-foot offset	.6	.6	1.7	100	1.0	1.0
List	3-bottom lister	.8	.8	1.1	48	.4	.4
Float	12-foot landplane	1.3	1.3	1.0	48	.6	.6
Roll	4-row roller	.4	.4	1.0	55	.2	.2
Bed	4-row bedder	.5	.5	1.0	57	.3	.3
Seed	4-row planter	2.7	1.5	1.0	100	2.7	1.5
Irrigate	---	2.6	---	3.4	100	8.8	---
Fertilize	4-row distributor	.6	.5	1.4	69	.6	.5
Cultivate	2-row cultivator	.6	.6	4.1	100	2.5	2.5
Cultivate and fertilize	2-row cult./attach.	.8	.6	2.0	20	.3	.2
Spray	8-row boom sprayer	.3	.3	5.5	67	1.1	1.1
Spray (custom)	plane	1/	1/	2.6	45	.1	.1
Spray (custom)	8-row boom sprayer	.3	.3	1.4	15	.1	.1
Weed and thin	---	17.1	---	2.2	38	14.3	---
Thin	---	24.6	---	1.0	33	8.1	---
Hoe and thin	---	12.9	---	1.2	35	5.4	---
Dust	4-row duster	.3	.3	3.0	3	1/	1/
Total	---	---	---	---	---	47.4	9.4
Harvest:							
Pull and top	---	56.5	---	1.0	35	19.8	---
Total 2/	---	---	---	---	---	19.8	---
Total preharvest and harvest	---	---	---	---	---	3/ 67.2	3/ 9.4

1/ Less than 0.05 hour.

2/ Excludes loading and hauling inputs on the acreage pulled and topped by farmer's crews, and all harvesting inputs on acreage harvested by the buyers.

3/ Average yield per acre - 256 50-pound sacks. Average labor and power used per sack - 0.26 hour and 0.04 hour, respectively.

Table C.--Onions: Usual labor and power inputs, Cameron and Hidalgo Counties, Texas, 1958-59

Operation	Times over	Time per acre, once over		Time per acre, total	
		Man	Power	Man	Power
	Number	Hours	Hours	Hours	Hours
Plow	1	1.1	1.1	1.1	1.1
Disk	2	.6	.6	1.2	1.2
Bed	1	.5	.5	.5	.5
Roll	1	.4	.4	.4	.4
Seed	1	2.7	1.5	2.7	1.5
Irrigate	3	2.6	---	7.8	---
Fertilize	1	.6	.5	.6	.5
Cultivate	4	.6	.6	2.4	2.4
Spray	6	.3	.3	1.8	1.8
Spray (custom, plane)	2	1/	1/	.1	.1
Weed and thin 2/	2	17.1	---	34.2	---
Total	---	---	---	52.8	9.5

1/ Less than 0.05 hour.
2/ Growers either weed and thin, hoe and thin, or thin without hoeing or weeding. The weed-and-thin operation was performed on more acres than either of the other two operations.

Table D.--Dry onions: Distribution of workers performing specified operations, by type of worker, 19 farms, Cameron and Hidalgo Counties, Texas, 1958-59

Operation	Type of worker			
	Operator and unpaid family	Year-round hired	Local seasonal	Foreign
	Percent	Percent	Percent	Percent
Plow	27	33	27	13
Disk	25	25	35	15
List	33	17	50	0
Float	43	29	14	14
Bed	23	23	39	15
Roll	0	100	0	0
Seed	20	37	40	3
Irrigate	10	31	31	28
Fertilize	25	33	34	8
Cultivate	32	21	37	10
Cultivate and fertilize	0	25	50	25
Spray	40	25	25	10
Weed and thin	0	3	33	64
Thin	0	0	43	57
Hoe and thin	2	0	36	62
Dust	0	100	0	0
Pull and top	0	0	68	32

Data presented in figure 10 and tables A, B, C, and D are based on information obtained covering production of black-eyed peas grown for the fresh market on 1,774 acres on 31 farms in 1958-59. The average yield per acre was 10.9 hundredweight of peas.

Tractors were the chief source of power on these farms. Unless otherwise indicated, they were used for operations listed. The size of tractor was not obtained, but considering the size of equipment used, it appears that these tractors were 2- and 3-plow tractors with drawbar horsepower ratings of 15 to 30.

Generally, black-eyed peas are grown on the nonirrigated land in the northern part of the two-county area. With dryland farming in this area, yields tend to be low, but then inputs, particularly fertilizer, are also low. Only 4 percent of the acreage was fertilized, and that particular acreage was irrigated.

Black-eyed peas are sold in the field, with the buyer harvesting the crop at his will. Most crops were sold by the ton at rates ranging from $35 to $55. The average rate received by farmers was $42 per ton.

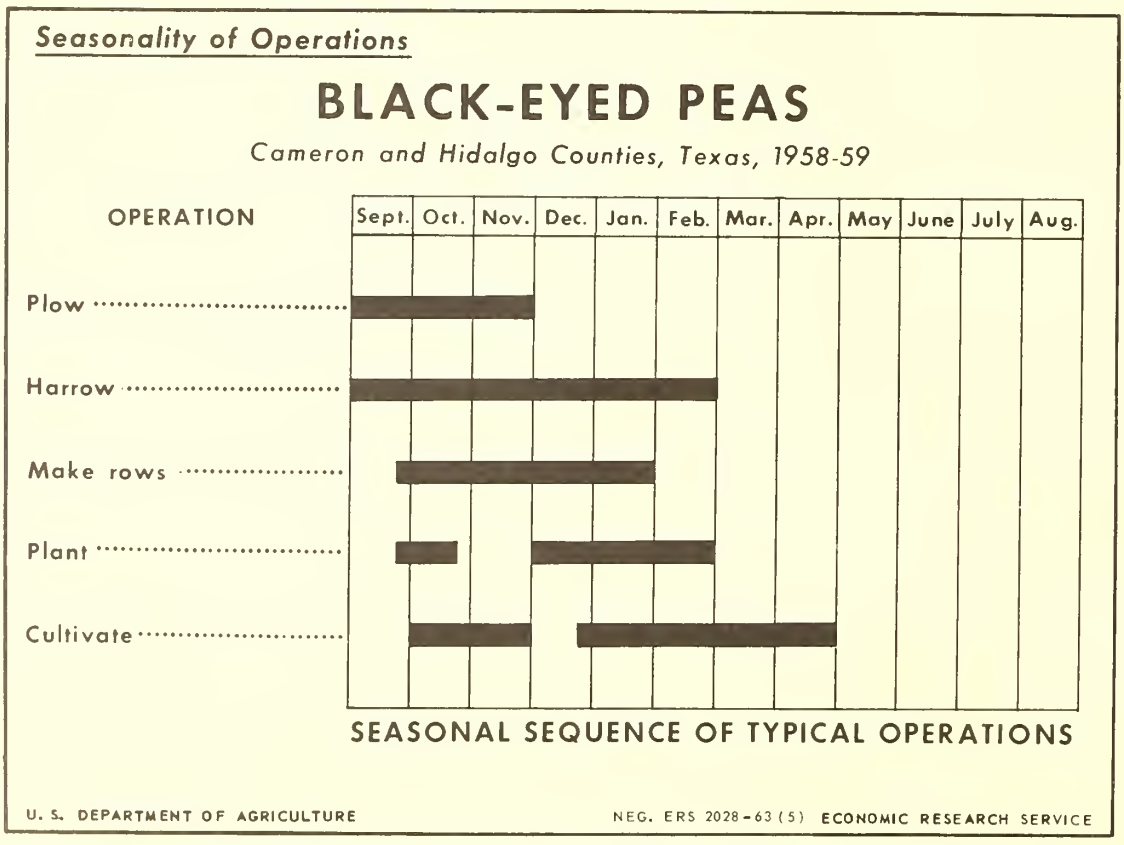

Figure 10

Table A.--Black-eyed peas: Materials used, averages for 1,774 acres on 31 farms, Cameron and Hidalgo Counties, Texas, 1958-59

Materials used	Unit	Units per acre covered	Price per unit	Cost per acre covered	Percentage of total acreage covered	Cost per acre, total acreage
		Number	Dollars	Dollars	Percent	Dollars
Seed	Lb.	18.7	0.24	4.49	100	4.49
Fertilizer, 20-10-0	Cwt.	1.3	4.00	5.20	4	.21
Spray	Gal.	.26	2.61	.68	13	.09
Dust, 5% DDT	Lb.	18.2	.07	1.27	22	.28
Sacks, burlap	Each	65	.15	9.75	4	.39
Irrigation fees	Acre	2	1.76	3.52	4	.14
Total materials	---	---	---	---	---	1/ 5.60

1/ Average yield per acre - 10.9 hundredweight. Average cost of materials used per hundredweight - $0.51.

Table B.--Black-eyed peas: Labor, power, and machinery used in producing and harvesting, by operation, averages for 1,774 acres on 31 farms, Cameron and Hidalgo Counties, Texas, 1958-59

Operation	Type and size of equipment	Time per acre, once over		Times over, acreage covered	Percentage of total acreage covered	Time per acre, total acreage	
		Man	Power			Man	Power
		Hours	Hours	Number	Percent	Hours	Hours
Preharvest:							
Plow	3-bot. disk	1.1	1.1	1.0	55	0.6	0.6
Harrow	8-foot tandem	.7	.7	1.3	98	.9	.9
Float	16-foot	.6	.6	1.0	4	1/	1/
Ditch	1-bot. ditch plow	.7	.7	1.0	4	1/	1/
Make rows	4-row middlebuster	.9	.9	1.3	90	1.1	1.1
Plant	4-row planter	.9	.9	1.0	100	.9	.9
Cultivate	4-row cultivator	.7	.7	3.3	100	2.3	2.3
Irrigate	---	1.3	---	1.1	4	.1	---
Hoe by hand	---	10.6	---	1.0	6	.6	---
Dust	8-row duster	.4	.4	1.7	22	.1	.1
Fertilize	2-row distributor	.9	.9	1.0	4	1/	1/
Spray	8-row boom	.3	.3	1.0	13	1/	1/
Total	---	---	---	---	---	6.6	5.9
Harvest:							
Pick by hand	---	26.3	---	2.3	2/ 5	3.0	---
Total	---	---	---	---	---	3.0	---
Total preharvest and harvest	---	---	---	---	---	3/ 9.6	3/ 5.9

1/ Less than 0.05 hour.
2/ The crop is generally sold in the field, with buyer performing all harvesting operations.
3/ Average yield per acre – 10.9 hundredweight. Average labor and power used per hundredweight – 0.9 hour and 0.5 hour, respectively.

Table C.--Black-eyed peas: Usual labor and power inputs, Cameron and Hidalgo Counties, Texas, 1958-59

Operation	Times over	Time per acre, once over		Time per acre, total 1/	
		Man	Power	Man	Power
	Number	Hours	Hours	Hours	Hours
Plow	1	1.1	1.1	1.1	1.1
Harrow	1	.7	.7	.7	.7
Make rows	1	.9	.9	.9	.9
Plant	1	.9	.9	.9	.9
Cultivate	3	.7	.7	2.1	2.1
Total	---	---	---	5.7	5.7

1/ Usually harvested by the buyer's crew.

Table D.--Black-eyed peas: Distribution of workers performing specified operations, by type of worker, 31 farms, Cameron and Hidalgo Counties, Texas, 1958-59

Operation	Type of worker			
	Operator and unpaid family	Year-round hired	Local seasonal	Foreign
	Percent	Percent	Percent	Percent
Plow	37	47	5	11
Harrow	37	55	3	5
Float	0	0	0	100
Ditch	0	0	0	100
Make rows	38	59	0	3
Plant	49	42	2	7
Cultivate	41	54	3	2
Irrigate	0	0	0	100
Hoe	0	0	0	100
Dust	25	50	0	25
Fertilize	100	0	0	0
Spray	67	33	0	0
Pick by hand	21	0	6	73

Data in figure 11 and tables A, B, C, and D are based on information obtained covering production of sweet peppers for the fresh market on 198 acres on 14 farms in 1958-59. The average yield per acre was 9,605 pounds.

The sweet pepper enterprise is a year-round operation in the Lower Rio Grande Valley. Growers producing for the late fall and winter market plant from late in June to mid-August and harvest from late in September through mid-January. The spring crop was planted from November through January and was harvested from early in March through June. In this survey, 73 percent of the acreage of peppers was grown for the late fall and winter market. Inputs for both crops were combined as one for tables A, B, C, and D.

Tractors were the chief source of power on these farms. Unless otherwise indicated, they were used for operations listed. Size of tractor was not obtained but considering the size of equipment used these tractors were 2- and 3-plow tractors with drawbar horsepower ratings of 15 to 30.

Most growers do not harvest the peppers that they produce. The common practice is to sell the crop growing in the field, with the buyer incurring all harvesting and hauling inputs. Only 34 percent of the acreage was picked by growers' crews.

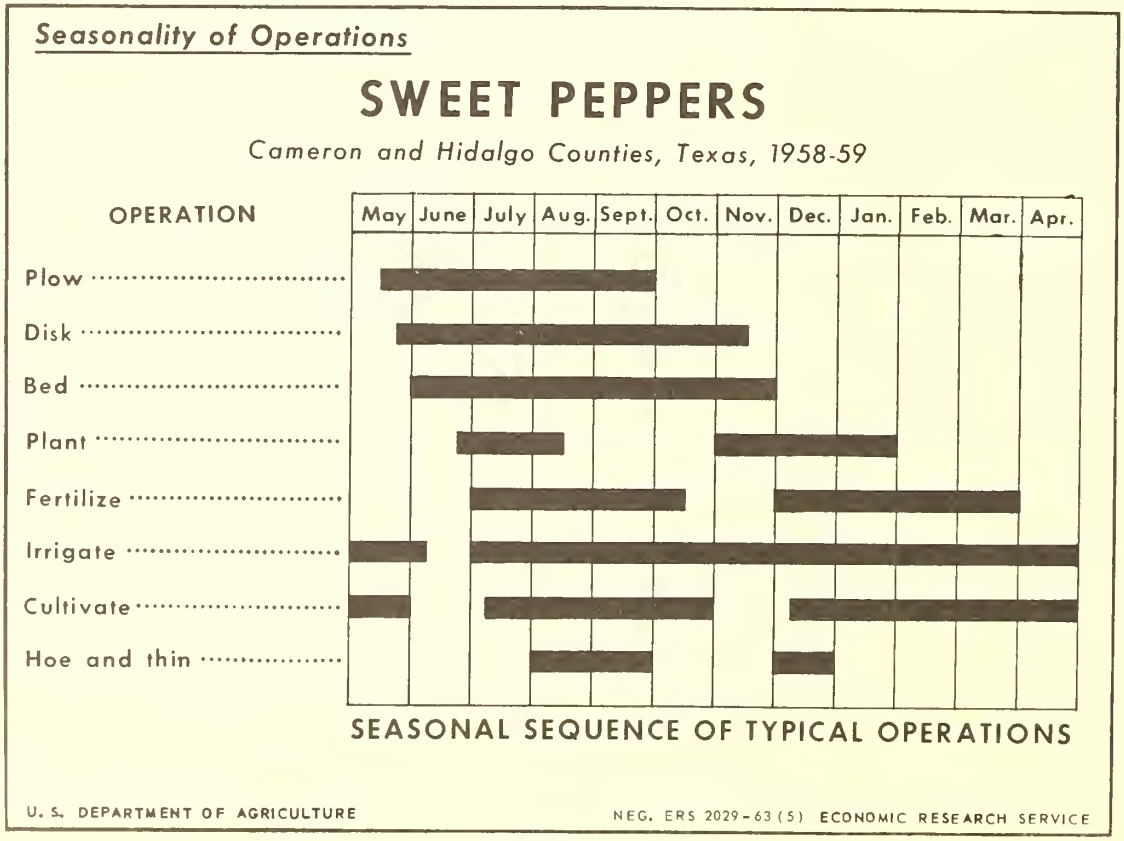

Figure 11

Table A.--Sweet peppers: Materials used and contract work hired, averages for 198 acres on 14 farms, Cameron and Hidalgo Counties, Texas, 1958-59

Item	Unit	Units per acre covered	Price per unit	Cost per acre covered	Percentage of total acreage covered	Cost per acre, total acreage
		Number	Dollars	Dollars	Percent	Dollars
Material used:						
Seed	Lb.	2.8	7.00	19.60	100	19.60
Fertilizer, 16-20-0	Cwt.	3.5	4.47	15.64	96	15.01
Fertilizer, 16-20-0 (liquid)	Gal.	22.6	.81	18.31	39	7.14
Weedkiller, butane	Gal.	5	.13	.65	1	.01
Spray, toxaphene-methyl-parathion	Qt.	17	.94	15.98	58	9.27
Dust, parathion-DDT	Lb.	72	.155	11.16	12	1.34
Irrigation	Applic.	5.4	1.54	8.32	100	8.32
Total	---	---	---	---	---	1/ 60.69
Contract work hired:						
Spray byplane, materials included	Applic.	5.3	2.99	15.85	33	5.23
Spray by ground rig, materials included	Applic.	2.0	9.25	18.50	10	1.85
Spray by ground rig, no materials	Applic.	6.0	2.00	12.00	4	.48
Dust by plane, no materials	Applic.	1.0	2.50	2.50	4	.10
Dust by plane, materials included (toxaphene-DDT)	Applic.	4.0	4.47	17.88	5	.89
Total	---	---	---	---	---	8.55
Total materials and contract work	---	---	---	---	---	2/ 69.24

1/ Excludes container costs which were not obtained.

2/ Average yield per acre - 96 hundredweight. Average cost of materials and contract work per hundredweight - $0.72.

Table B.--Sweet peppers: Labor, power, and machinery used in producing and harvesting, averages for 198 acres on 14 farms, Cameron and Hidalgo Counties, Texas, 1958-59

Operation	Type and size of equipment	Time per acre, once over		Times over, acreage covered	Percentage of total acreage covered	Time per acre, total acreage	
		Man	Power			Man	Power
		Hours	Hours	Number	Percent	Hours	Hours
Preharvest:							
Chop weeds	6-foot shredder	1.5	1.5	2.0	3	0.1	0.1
Plow	3-bot. disk plow	1.4	1.4	1.0	77	1.1	1.1
Disk	7-foot tandem	.7	.7	1.7	100	1.2	1.2
Float	10-foot landplane	.8	.8	1.2	48	.5	.5
Roll	12-foot roller	.7	.7	1.0	27	.2	.2
Bed and rebed	4-row middlebuster	.7	.7	1.1	100	.8	.8
Plant	4-row planter	.9	.8	1.0	74	.7	.6
Plant and fertilize	4-row planter	1.2	.8	1.0	26	.3	.2
Fertilize	4-row distributor	.7	.7	1.6	65	.7	.7
Fertilize by hand	---	5.0	---	2.0	10	1.0	---
Irrigate	---	2.0	---	5.4	100	10.8	---
Cultivate	2-row cultivator	1.0	1.0	3.4	81	2.8	2.8
Cultivate and fertilize	2-row cult./attach.	1.4	1.2	1.0	10	.1	.1
Hoe	---	13.7	---	2.2	26	7.8	---
Hoe and thin	---	25.2	---	1.0	52	13.1	---
Weed	---	40.1	---	1.3	24	12.5	---
Spray	8-row boom	.4	.4	4.2	23	.4	.4
Spray (custom)	Plane	1/	1/	5.3	33	.1	.1
Spray (custom)	8-row boom	.4	.4	3.1	14	.2	.2
Dust	8-row duster	.1	.1	5.0	8	1/	1/
Dust (custom)	Plane	1/	1/	2.8	9	1/	1/
Total	---	---	---	---	---	54.4	9.0
Harvest:							
Pick by hand	---	17.3	---	5.1	34	30.0	---
Total	---	---	---	---	---	30.0	---
Total preharvest and harvest	---	---	---	---	---	2/ 84.4	2/ 9.0

1/ Less than 0.05 hour.

2/ Average yield per acre - 96 hundredweight. Average labor and power used per hundredweight - 0.9 hour and 0.1 hour, respectively.

Table C.--Sweet peppers: Usual labor and power inputs, Cameron and Hidalgo Counties, Texas, 1958-59

Operation	Times over	Time per acre, once over		Time per acre, total	
		Man	Power	Man	Power
	Number	Hours	Hours	Hours	Hours
Plow	1	1.4	1.4	1.4	1.4
Disk	2	.7	.7	1.4	1.4
Bed	1	.7	.7	.7	.7
Plant	1	.9	.8	.9	.8
Fertilize	2	.7	.7	1.4	1.4
Irrigate	5	2.0	---	10.0	---
Cultivate	3	1.0	1.0	3.0	3.0
Hoe and thin	1	25.2	---	25.2	---
Total	---	---	---	44.0	8.7

Table D.--Sweet peppers: Distribution of workers performing specified operations, by type of worker, 14 farms, Cameron and Hidalgo Counties, Texas, 1958-59

Operation	Type of worker				
	Operator and unpaid family	Year-round hired	Local seasonal	Domestic migratory	Foreign
	Percent	Percent	Percent	Percent	Percent
Chop weeds	0	0	0	0	100
Plow	17	34	33	8	8
Disk	14	43	29	7	7
Float	0	50	50	0	0
Roll	0	33	34	0	33
Bed and rebed	20	42	30	4	4
Plant	16	37	32	5	10
Plant and fertilize	10	41	30	8	11
Fertilize	0	40	40	0	20
Fertilize by hand	0	0	100	0	0
Irrigate	9	39	26	4	22
Cultivate	20	33	33	7	7
Cultivate and fertilize	100	0	0	0	0
Hoe	0	0	36	13	51
Hoe and thin	0	0	80	0	20
Weed	0	0	88	0	12
Spray 1/	25	50	25	0	0
Dust 1/	0	100	0	0	0
Pick by hand	4	0	47	22	27

1/ Excludes contract operations.

Data in figure 12 and tables A, B, C, and D are based on information covering the production of squash for the fresh market on 152 acres on 11 farms in 1958-59. The average yield per acre was 62 bushels.

Two types of squash were grown on these farms--banana and summer crooked necks--on approximately equal acreages. While squash is grown for both the fall and spring markets, the spring harvested crop occupied 73 percent of the total squash acreage.

Tractors were the chief source of power on these farms. Unless otherwise indicated, they were used for operations listed. Drawbar horsepower ratings were not obtained in the survey, but size of equipment indicates these tractors were 2-plow tractors with drawbar horsepower ratings of 15 to 20.

Harvesting was done primarily by local seasonal workers. The average piece rate reported to pick and pack a bushel of squash was $0.25.

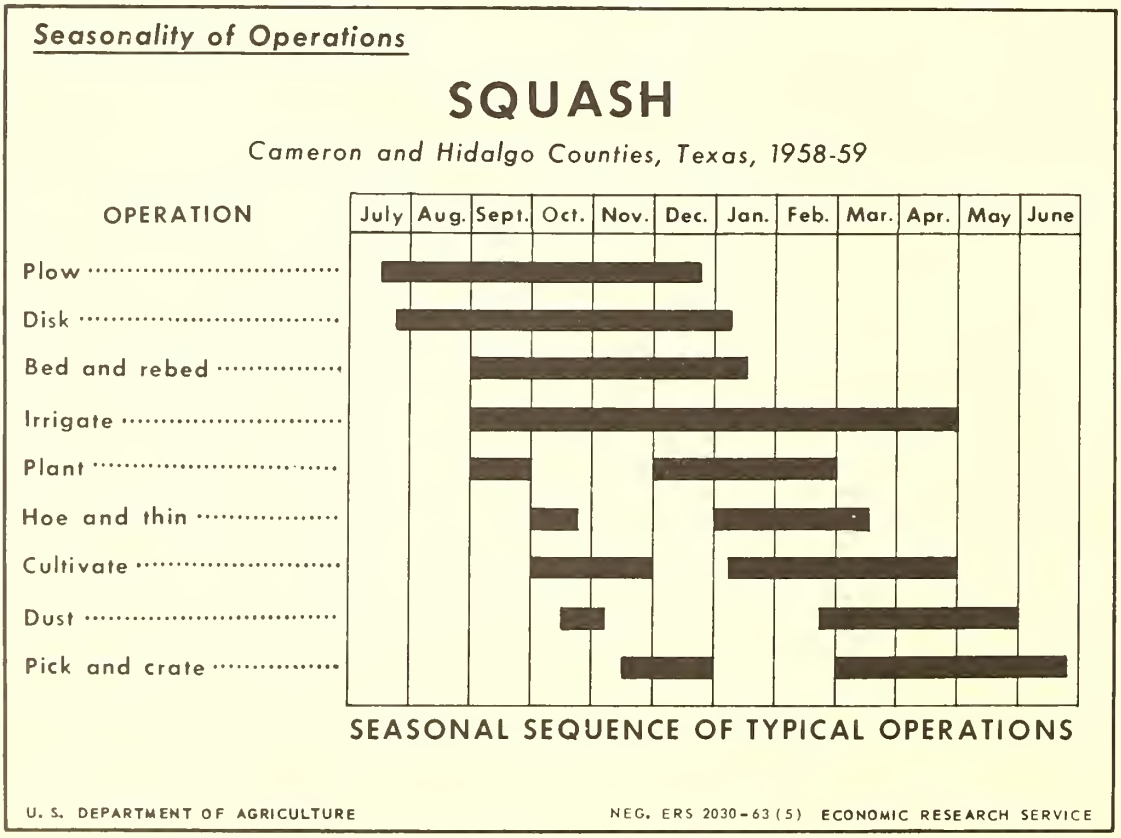

Figure 12

Table A.--Squash: Materials used, averages for 152 acres on 11 farms, Cameron and Hidalgo Counties, Texas, 1958-59

Materials used	Unit	Units per acre covered	Price per unit	Cost per acre covered	Percentage of total acreage covered	Cost per acre, total acreage
		Number	Dollars	Dollars	Percent	Dollars
Seed	Lb.	4.1	1.35	5.54	100	5.54
Fertilizer, 16-20-0	Cwt.	1.6	4.98	7.97	48	3.83
Dust, sulfur	Lb.	66	.064	4.22	53	2.24
Irrigation fees	Applic.	2.4	1.87	4.49	84	3.77
Baskets, bushel	Each	62	.35	21.70	93	20.18
Total materials	---	---	---	---	---	1/ 35.56

1/ Average yield per acre -62 bushels. Average cost of materials per bushel -$0.57.

Table B.--Squash: Labor, power, and machinery used in producing and harvesting, by operation, 152 acres on 11 farms, Cameron and Hidalgo Counties, Texas, 1958-59

Operation	Type and size of equipment	Time per acre, once over		Times over, acreage covered	Percentage of total acreage covered	Time per acre, total acreage	
		Man	Power			Man	Power
		Hours	Hours	Number	Percent	Hours	Hours
Preharvest:							
Cut stalks	6-foot stalk cutter	0.5	0.5	2.0	7	0.1	0.1
Plow	2-bot. disk	1.0	1.0	1.1	52	.6	.6
Disk	8-foot tandem	.5	.5	2.7	97	1.3	1.3
Float	12-foot landplane	.4	.4	2.0	33	.3	.3
List	2-row lister	1.4	1.4	2.0	5	.1	.1
Bed and rebed	3-bottom middlebuster	1.0	1.0	2.0	84	1.7	1.7
Irrigate	---	1.7	---	2.4	84	3.4	---
Plant	4-row planter	.8	.8	1.0	100	.8	.8
Hoe and thin	---	8.1	---	2.4	74	14.4	---
Cultivate	4-row cultivator	.8	.8	3.4	100	2.7	2.7
Fertilize	2-row distributor	1.5	1.5	1.1	45	.7	.7
Cultivate and fertilize	2-row cult./attach.	2.0	2.0	1.0	3	.1	.1
Dust	2-row duster	1.3	1.3	1.8	53	1.2	1.2
Total	---	---	---	---	---	27.4	9.6
Harvest:							
Pick and crate by hand	---	5.4	---	12.1	93	60.8	---
Total	---	---	---	---	---	1/ 60.8	---
Total preharvest and harvest	---	---	---	---	---	2/ 88.2	2/ 9.6

1/ The remaining 7 percent was harvested by the buyer.

2/ Average yield per acre - 62 bushels. Average labor and power used per acre - 1.42 hours and 0.15 hour, respectively.

Table C.--Squash: Usual labor and power inputs, Cameron and Hidalgo Counties, Texas, 1958-59

Operation	Times over	Time per acre, once over		Time per acre, total	
		Man	Power	Man	Power
	Number	Hours	Hours	Hours	Hours
Plow	1	1.0	1.0	1.0	1.0
Disk	3	.5	.5	1.5	1.5
Bed and rebed	2	1.0	1.0	2.0	2.0
Irrigate	2	1.7	---	3.4	---
Plant	1	.8	.8	.8	.8
Hoe and thin	2	8.1	---	16.2	---
Cultivate	3	.8	.8	2.4	2.4
Dust	2	1.3	1.3	2.6	2.6
Pick and crate	12	5.4	---	64.8	---
Total	---	---	---	94.7	10.3

Table D.--Squash: Distribution of workers performing specified operations, by type of worker, 11 farms, Cameron and Hidalgo Counties, Texas, 1958-59

Operation	Type of worker		
	Operator and unpaid family	Local seasonal	Foreign
	Percent	Percent	Percent
Cut stalks	100	0	0
Plow	33	34	33
Disk	60	20	20
Float	0	100	0
List	100	0	0
Bed and rebed	43	14	43
Irrigate	25	25	50
Plant	50	25	25
Hoe and thin	16	62	22
Cultivate	70	20	10
Fertilize	80	20	0
Cultivate and fertilize	0	0	100
Dust	67	0	33
Pick and crate	6	75	19

Data in figure 13 and tables A, B, C, and D are based on information covering production of tomatoes for fresh market use on 3,076 acres on 165 farms in 1958-59. The average yield per acre was 3.98 tons.

Tractors were the chief source of power on these farms. Unless otherwise indicated, they were used for operations listed. The size of tractor was not obtained. Considering the size of equipment used, it appears the average tractor was about a 3-plow tractor with a drawbar horsepower rating of 20 to 30.

In fitting the land for planting, about one-third of the acreage was preirrigated. On all the acreage studied, tomatoes were seeded directly in the field. There was no transplanting other than to fill skips in rows. This was done as part of the thinning operation.

Growers used many and varied analyses of fertilizer, but the most common analysis in both liquid and dry form was 16-20-0. The bulk of the fertilizer was applied with ground equipment. However, some was applied in irrigation water on about a third of the acreage. In addition, fertilizer was also applied by plane in combination with sprays and dusts.

Production on slightly over half of the acreage was sold growing in the field. In fields which were picked by crews hired by the farmer, nearly half of the workers were Mexican Nationals. Piece rates paid for picking ranged from $0.40 to $0.80 per hundredweight and averaged $0.46. Piece rates for picking, loading, and hauling ranged from $0.80 to $1.20 per hundredweight and averaged $1.03. The above rates are for green- and pink-wrap tomatoes. Rates for picking red-ripe tomatoes averaged $0.15 less per hundredweight.

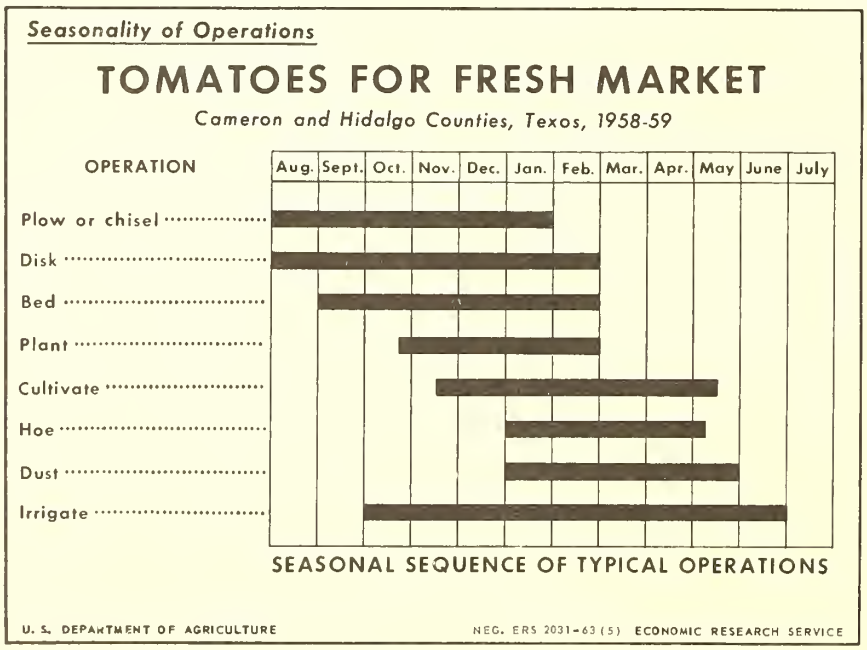

Figure 13

Table A.--Tomatoes: Materials used and contract work hired, averages for 3,076 acres on 165 farms, Cameron and Hidalgo Counties, Texas, 1958-59

Item	Unit	Units per acre covered	Price per unit	Cost per acre covered	Percentage of total acreage covered	Cost per acre, total acreage
		Number	Dollars	Dollars	Percent	Dollars
Materials used:						
Seed	Lb.	1.0	6.31	6.31	100	6.31
Fertilizer, applied dry:						
0-20-0	Cwt.	2.5	3.20	8.00	6	.48
5-10-5	Cwt.	8.5	3.81	32.38	4	1.30
10-20-0	Cwt.	2.9	4.54	13.17	7	.92
12-24-12	Cwt.	3.4	5.41	18.39	4	.74
16-20-0	Cwt.	3.0	4.55	13.65	12	1.64
16-32-16	Cwt.	3.8	5.57	21.17	4	.85
20-20-0	Cwt.	2.3	4.01	9.22	5	.46
33-0-0	Cwt.	2.4	4.32	10.37	3	.31
82-0-0	Cwt.	.5	13.43	6.72	3	.20
Fertilizer, applied in irrigation water:						
16-20-0	Gal.	11.5	.80	9.20	12	1.10
33-0-0	Gal.	14.6	.56	8.18	4	.33
82-0-0	Gal.	26.1	.98	25.58	3	.77
12-24-12	Gal.	36.9	.50	18.45	9	1.66
Assorted analyses	Cwt.	1.4	7.40	10.36	7	.73
Dust, assorted 1/	Lb.	57.5	.14	8.05	87	7.00
Sprays, assorted 1/	Gal. 2/	2.2	3.30	7.26	41	2.98
Irrigation	Applic.	2.5	1.82	4.55	95	4.32
Total	---	---	---	---	---	2/ 32.10
Contract work hired:						
Deep plow with crawler tractor	Acre	1.0	5.00	5.00	1	.05
Fertilize, spreader and fertilizer	Acre	1.0	11.00	11.00	1	.11
Dust, by plane, application only	Acre	2.5	.91	2.28	13	.30
Dust by plane, includes dust 1/	Acre	3.3	3.63	11.98	18	2.16
Spray by plane, application only	Acre	1.5	1.69	2.54	4	.10
Spray by plane, includes spray 1/	Acre	3.0	6.11	18.33	18	3.30
Spray by boom sprayer, includes spray 1/	Acre	2.6	6.73	17.50	4	.70
Dust by 4-row duster, includes dust 1/	Acre	1.2	4.57	5.48	1	.05
Total	---	---	---	---	---	6.77
Total materials and contract work	---	---	---	---	---	3/ 38.87

1/ Includes fungicides, insecticides, and some fertilizers. 2/ Wettable dusts were converted to liquid gallon equivalents.
3/ Average yield per acre--3.98 tons. Average cost of materials and contract work per ton--$9.77.

Table B.--Tomatoes: Labor, power, and machinery used in producing and harvesting, by operation, averages for 3,076 acres on 165 farms, Cameron and Hidalgo Counties, Texas, 1958-59

Operation	Type and size of equipment	Time per acre, once over		Times over, acreage covered	Percentage of total acreage covered	Time per acre, total acreage	
		Man	Power			Man	Power
		Hours	Hours	Number	Percent	Hours	Hours
Preharvest:							
Cut stalks	2-row shredder	0.8	0.8	1.0	7	0.1	0.1
Plow	3-bottom disk	1.4	1.4	1.2	29	.5	.5
Plow (custom)	3-bottom disk	1.0	1.0	1.0	1	1/	1/
Chisel	7-point chisel	1.1	1.1	1.6	31	.5	.5
Disk	7-foot tandem	.8	.8	2.3	92	1.7	1.7
List	3-bottom lister	.8	.8	1.4	20	.2	.2
List and fertilize	3-bottom lister/attach.	.9	.8	1.0	1	1/	1/
Bed and rebed	2-bottom lister	.8	.8	1.3	68	.7	.7
Bed and fertilize	3-bottom lister/attach.	1.0	.8	1.0	2	1/	1/
Fertilize (custom)	4-row distributor	.8	.8	1.0	1	1/	1/
Float	10-foot landplane	.6	.6	1.2	31	.2	.2
Plant	2-row seeder	.9	.8	1.0	79	.7	.6
Plant and fertilize	2-row seeder/attach.	1.2	.9	1.0	21	.3	.2
Cultivate	2-row cultivator	.8	.8	3.9	91	2.8	2.8
Cultivate and fertilize	2-row cultivator/attach.	.9	.8	1.3	23	.3	.2
Fertilize	2-row distributor	.8	.8	1.3	39	.4	.4
Make borders	Border disk	1.4	.4	1.3	20	.1	.1
Irrigate 2/	---	2.6	---	2.6	96	6.5	---
Clean canals	---	1.7	---	1.0	5	.1	---
Thin	---	12.6	---	1.0	33	4.2	---
Hoe and thin	---	11.6	---	1.6	5	.9	---
Hoe	---	10.8	---	1.5	51	8.3	---
Weed	---	10.1	---	1.6	23	3.7	---
Dust	4-row duster	.5	.4	2.0	65	.6	.5
Dust (custom)	4-row duster	.5	.4	1.2	1	1/	1/
Dust (custom)	Plane	.1	.1	2.9	27	.1	.1
Dust	---	3.2	---	2.9	3	.3	---
Spray	8-row boom sprayer	.5	.5	3.0	29	.4	.4
Spray (custom)	8-row boom sprayer	.4	.4	2.6	4	1/	1/
Spray (custom)	Plane	.1	.1	2.7	22	.1	.1
Total	---	---	---	---	---	33.7	9.3
Harvest:							
Pick, load, and haul	Truck	29.1	1.6	2.7	3/48	37.7	2.1
Total	---	---	---	---	---	37.7	2.1
Total preharvest and harvest	---	---	---	---	---	4/71.4	4/11.4

1/ Less than 0.05 hour.

2/ Includes addition of liquid fertilizer.

3/ The remaining acreage was sold unharvested in the field.

4/ Average yield per acre--3.98 tons. Average labor and power used per ton--17.9 hours and 2.3 hours, respectively.

Table C.--Tomatoes: Usual labor and power inputs, Cameron and Hidalgo Counties, Texas, 1958-59

Operation	Times over	Time per acre, once over		Time per acre, total	
		Man	Power	Man	Power
	Number	Hours	Hours	Hours	Hours
Plow and chisel	1	1.1	1.1	1.1	1.1
Disk	2	.8	.8	1.6	1.6
Bed	1	.8	.8	.8	.8
Plant	1	.9	.8	.9	.8
Cultivate	4	.8	.8	3.2	3.2
Irrigate	3	2.6	---	7.8	---
Hoe	2	10.8	---	21.6	---
Dust	2	.5	.4	1.0	.8
Total	---	---	---	38.0	8.3

Table D.--Tomatoes: Distribution of workers performing specified operations, by type of worker, 165 farms, Cameron and Hidalgo Counties, Texas, 1958-59

Operation	Type of worker				
	Operator and unpaid family	Year-round hired	Local seasonal	Domestic migratory	Foreign
	Percent	Percent	Percent	Percent	Percent
Cut stalks	71	29	0	0	0
Plow 1/	33	36	12	3	16
Chisel	30	39	17	0	14
Disk	35	29	19	3	14
List	45	24	17	0	14
List and fertilize	0	100	0	0	0
Bed and rebed	45	18	19	3	15
Float	30	48	15	0	7
Plant	40	28	17	3	12
Plant and fertilize	35	31	20	0	14
Cultivate	41	20	21	3	15
Cultivate and fertilize	40	31	11	0	18
Fertilize 1/	23	36	22	3	16
Make borders	43	29	14	0	14
Irrigate	20	15	34	5	26
Clean canals	0	100	0	0	0
Thin	3	4	63	4	26
Hoe and thin	16	0	43	21	20
Hoe	7	1	33	3	56
Weed	15	3	67	3	12
Dust by hand	38	6	19	12	25
Dust 1/	50	24	18	4	4
Spray 1/	43	23	15	0	19
Pick	5	0	36	11	48

1/ Excludes custom operations.

Data in figure 14 and tables A, B, C, and D are based on information covering production of turnips and turnip greens for the fresh market on 77 acres on 9 farms in 1958-59. The average yield per acre was 1.9 tons of greens and 1.3 tons of topped turnips.

Tractors were the main source of power on these farms. Unless otherwise indicated, they were used for operations listed. Drawbar horsepower ratings were not obtained in the survey, but size of equipment used indicates that these tractors were 2-plow tractors with drawbar horsepower ratings of 15 and 20.

The production of turnips in the area was two-fold: for greens and for roots. While some acreage was harvested only for greens, most of the acreage was harvested for both greens and roots. Generally, two cuttings of greens were made before the roots were pulled.

Material inputs used in producing turnips were restricted to seed and water. Fertilizer was not used, as turnips, tolerating low soil fertility, obtained sufficient plant nutrients from the soil when following heavily fertilized cotton. No container costs were obtained from growers, yet 78 percent of the acreage was harvested by farmer-supervised crews. Hauling was performed by the purchaser.

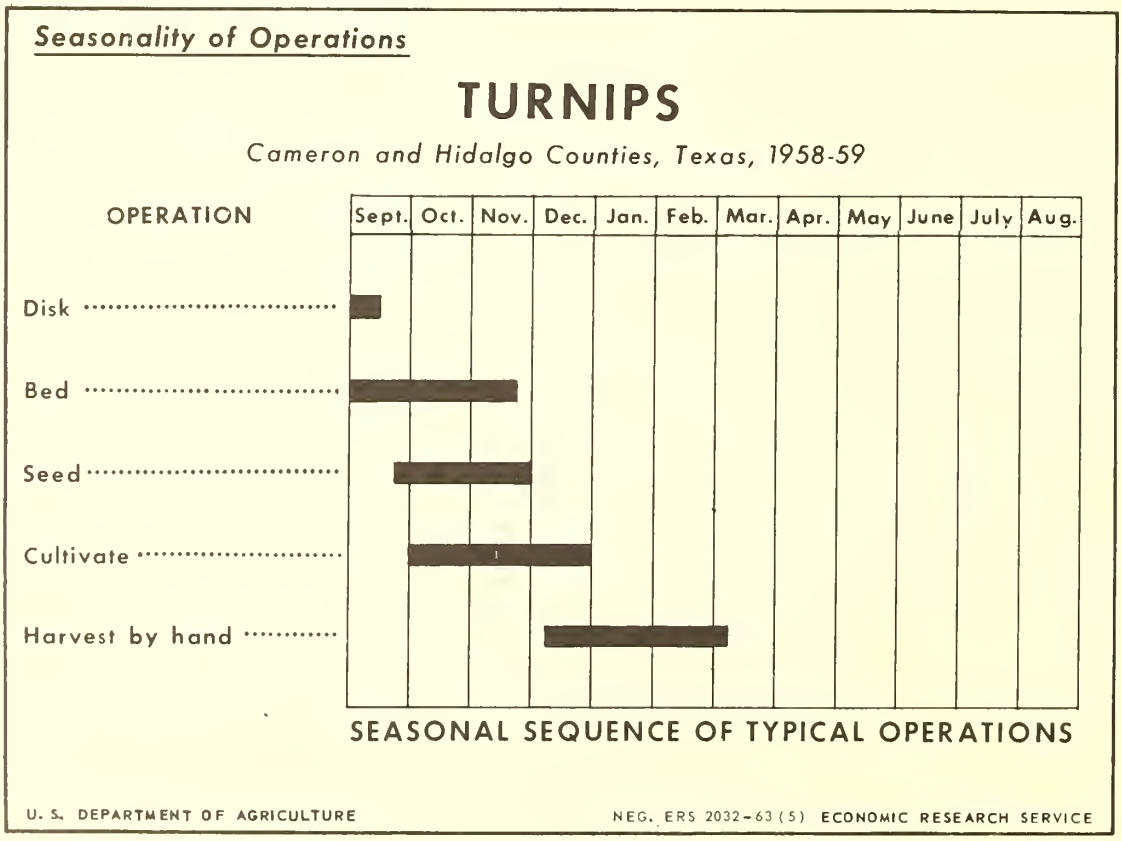

Figure 14

Table A. --Turnips: Materials used, averages for 77 acres on 9 farms, Cameron and Hidalgo Counties, Texas, 1958-59

Materials used	Unit	Units per acre covered	Price per unit	Cost per acre covered	Percentage of total acreage covered	Cost per acre, total acreage
		Number	Dollars	Dollars	Percent	Dollars
Seed	Lb.	2.1	0.90	1.89	100	1.89
Irrigation fees	Applic.	1.9	1.77	3.36	43	1.44
Total materials used	---	---	---	---	---	1/ 3.33

1/ Average yield per acre--1.9 tons of greens and 1.3 tons of turnips. Average cost of materials per ton of topped turnips--$2.56, excluding container costs which were not obtained.

Table B. --Turnips: Labor, power, and machinery used in producing and harvesting, by operation, averages for 77 acres on 9 farms, Cameron and Hidalgo Counties, Texas, 1958-59

Operation	Type and size of equipment	Time per acre, once over		Times over, acreage covered	Percentage of total acreage covered	Time per acre, total acreage	
		Man	Power			Man	Power
		Hours	Hours	Number	Percent	Hours	Hours
Preharvest:							
Plow	2-bottom disk	1.8	1.8	1.0	48	0.9	0.9
Disk	6-foot tandem	.9	.9	1.5	100	1.4	1.4
List	2-row lister	2.1	2.1	1.0	14	.3	.3
Float	10-foot landplane	.9	.9	1.0	22	.2	.2
Bed	2-row middlebuster	1.8	1.8	1.0	80	1.4	1.4
Seed	2-row seeder	1.4	1.1	1.0	100	1.4	1.1
Irrigate	---	2.8	---	1.9	43	2.3	---
Cultivate	2-row cultivator	.8	.8	2.6	81	1.7	1.7
Weed	---	4.4	---	1.0	6	.3	---
Total	---	---	---	---	---	9.9	7.0
Harvest:							
Cut greens and pack by hand, and pull turnips, top and pack by hand	---	56.7	---	3.2	78	141.5	---
Total	---	---	---	---	---	141.5	---
Total preharvest and harvest	---	---	---	---	---	1/ 151.4	1/ 7.0

1/ Average yield per acre--1.9 tons of greens and 1.3 tons of turnips. Average labor and power used per ton of topped turnips--116.5 hours and 5.4 hours, respectively.

Table C. --Turnips: Usual labor and power inputs, Cameron and Hidalgo Counties, Texas, 1958-59

Operation	Times over	Times per acre, once over		Times per acre, total	
		Man	Power	Man	Power
	Number	Hours	Hours	Hours	Hours
Disk	2	0.9	0.9	1.8	1.8
Bed	1	1.8	1.8	1.8	1.8
Seed	1	1.4	1.1	1.4	1.1
Cultivate	3	.8	.8	2.4	2.4
Harvest by hand	3	56.7	---	170.1	---
Total	---	---	---	177.5	7.1

Table D. --Turnips: Distribution of workers performing specified operations, by type of worker, 9 farms, Cameron and Hidalgo Counties, Texas, 1958-59

Operation	Type of worker			
	Operator and unpaid family	Year-round hired	Local seasonal	Foreign
	Percent	Percent	Percent	Percent
Plow	80	20	0	0
Disk	80	10	0	10
List	100	0	0	0
Float	50	50	0	0
Bed	100	0	0	0
Seed	84	8	0	8
Irrigate	71	0	0	29
Cultivate	83	17	0	0
Weed	100	0	0	0
Harvest	32	0	31	37

Data presented in tables A, B, C, and D and in figure 15 are based on information obtained covering production of watermelons for the fresh market on 403 acres on 7 farms in 1958-59. The average yield per acre was 2.26 tons.

Tractors were the chief source of power on these farms. Unless otherwise indicated, they were used for operations listed. The size of tractor was not obtained, but considering the size of equipment used, it appears that the average tractor was about a 3-plow tractor with a drawbar horsepower rating of 20 to 30.

Watermelons were grown on dry land north of the irrigated sections of the area. Farmers did not apply heavy rates of fertilizer to this crop, as there was insufficient ground water available for liberal applications.

As is true with many other crops, growers sold their watermelons unharvested in the fields. In 1959, farmers received from $20 to $240 per acre for their melons. The most common rate was 25 dollars a ton.

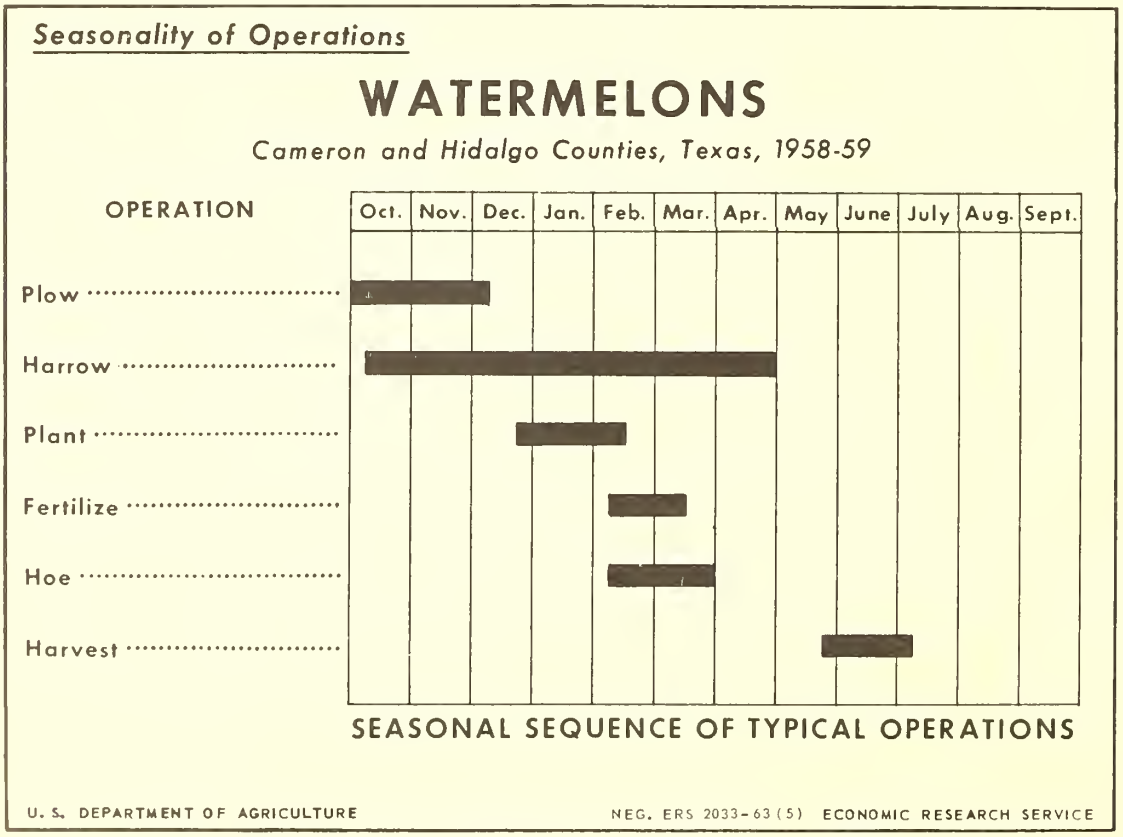

Figure 15

Table A. --Watermelons: Materials used, averages for 403 acres on 7 farms, Cameron and Hidalgo Counties, Texas, 1958-59

Materials used	Unit	Units per acre covered	Price per unit	Cost per acre covered	Percentage of total acreage covered	Cost per acre, total acreage
		Number	Dollars	Dollars	Percent	Dollars
Seed	Lb.	1.2	1.12	1.34	100	1.34
Fertilizer, 20-20-0	Cwt.	1.5	3.32	4.98	79	3.93
Plastic covers	Each	500	.01	5.00	19	.95
Spray, 3% parathion	Pint	.5	1.75	.88	9	.08
Total	---	---	---	---	---	1/ 6.30

1/ Average yield per acre--2.26 tons. Average cost of materials per ton--$2.79.

Table B. --Watermelons: Labor, power, and machinery used in producing and harvesting, averages for 403 acres on 7 farms, Cameron and Hidalgo Counties, Texas, 1958-59

Operation	Type and size of equipment	Time per acre, once over		Times over, acreage covered	Percentage of total acreage covered	Time per acre, total acreage	
		Man	Power			Man	Power
		Hours	Hours	Number	Percent	Hours	Hours
Preharvest:							
Plow	3-bot. 16 in. moldbd.	0.9	0.9	1.0	62	0.6	0.6
Plow with horses	1-bot. 14 in. moldbd.	1.1	2.2	1.0	30	.3	.7
Harrow	16-foot tandem disk	.5	.5	5.7	70	2.0	2.0
Harrow with horses	5-foot tandem disk	.7	1.4	3.0	30	.6	1.3
Make rows	4-row middlebuster	.7	.7	1.0	44	.3	.3
Plant	1-row planter	.7	.6	1.0	70	.5	.4
Plant with horses	1-row planter	.8	1.6	1.0	30	.2	.5
Fertilize	1-row distributor	.4	.4	1.0	38	.2	.2
Fertilize with horses	1-row distributor	.5	1.0	1.0	30	.2	.3
Cover and uncover by hand	---	2.7	---	1.0	19	.5	---
Hoe by hand	---	2.5	---	1.0	73	1.8	---
Cultivate and fertilize	1-row cult./fert. attach.	.7	.7	1.0	11	.1	.1
Spray	2-row sprayer	.1	.1	1.0	9	1/	1/
Total	---	---	---	---	---	2/ 7.3	2/ 6.4

1/ Less than 0.05 hour.

2/ Average yield per acre--2.26 tons. Average labor and power used per ton--3.2 hours and 2.8 hours, respectively. No harvest labor is included, as the entire crop was sold in the field.

Table C. --Watermelons: Usual labor and power inputs, Cameron and Hidalgo Counties, Texas, 1958-59

Operation	Times over	Time per acre, once over		Time per acre, total 1/	
		Man	Power	Man	Power
	Number	Hours	Hours	Hours	Hours
Plow	1	0.9	0.9	0.9	0.9
Harrow	6	.5	.5	3.0	3.0
Plant	1	.7	.6	.7	.6
Fertilize	1	.4	.4	.4	.4
Hoe	1	2.5	---	2.5	---
Total	---	---	---	7.5	4.9

1/ Does not include harvest inputs as crop is sold in the field and buyers incur the cost of harvesting inputs.

Table D. --Watermelons: Distribution of workers performing specified operations, by type of worker, 7 farms, Cameron and Hidalgo Counties, Texas, 1958-59

Operation	Type of worker			
	Operator and unpaid family	Year-round hired	Local seasonal	Foreign
	Percent	Percent	Percent	Percent
Plow	33	67	0	0
Plow with horses	0	100	0	0
Harrow	43	57	0	0
Harrow with horses	0	100	0	0
Make rows	67	33	0	0
Plant	43	57	0	0
Plant with horses	0	100	0	0
Fertilize	50	50	0	0
Fertilize with horses	0	100	0	0
Cover and uncover plants	0	100	0	0
Hoe	0	39	15	46
Cultivate and fertilize	100	0	0	0
Spray	100	0	0	0

The crops included in this section are those which, at time of planting, the grower intended to produce for sale to the processing industry.

Snapbeans

Data presented in figure 16 and tables A, B, C, and D are based on information obtained covering production of snapbeans for processing, on 191 acres on 11 farms in 1958-59. The average yield was 2.2 tons per acre.

Tractors were the chief source of power on these farms. Unless otherwise indicated, they were used for operations listed. While information as to size of tractor was not obtained, the size of equipment used would indicate the average tractor to be a 2-plow tractor with a drawbar horsepower rating of 15 to 20.

Snapbeans for processing are grown for both fall and spring harvest. The fall harvested acreage generally makes up 60-65 percent of the total, but on the sampled farms spring harvested acreage predominated. Therefore, the seasonality of operations chart excludes operations on fall harvested beans, but tables A, B, C, and D represent average inputs for the fall and spring crops combined.

Growers of snapbeans for processing usually sell their beans unharvested in the field. They are paid a rate per ton when harvested by the processor. Only 17 percent of the acreage was harvested by farmer-supervised crews.

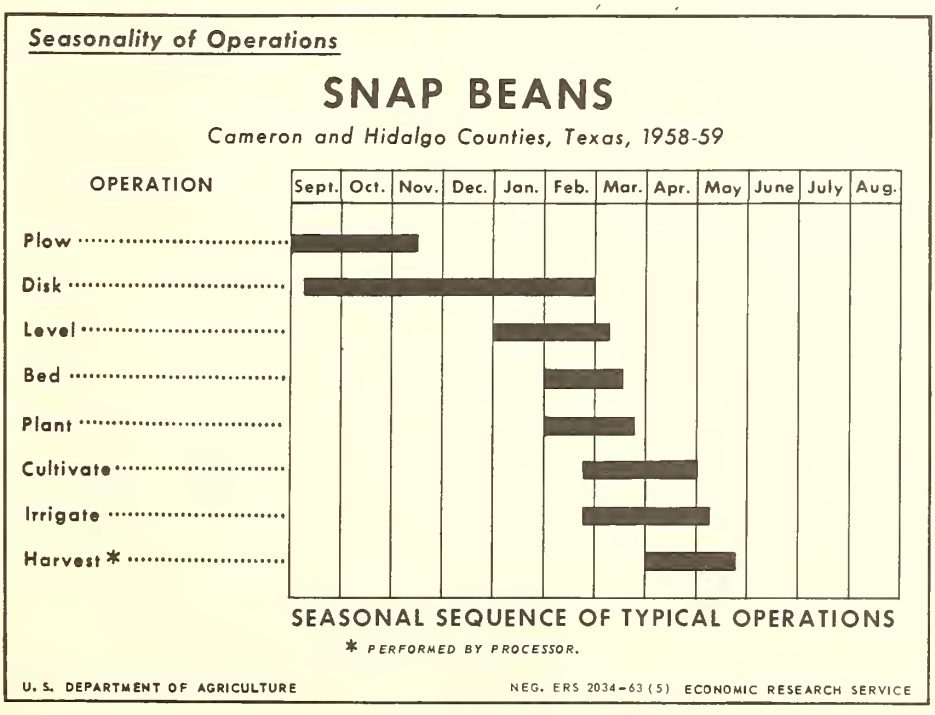

Figure 16

Table A. --Snapbeans: Materials used, averages for 191 acres on 11 farms, Cameron and Hidalgo Counties, Texas, 1958-59

Materials used	Unit	Units per acre covered	Price per unit	Cost per acre covered	Percentage of total acreage covered	Cost per acre, total acreage
		Number	Dollars	Dollars	Percent	Dollars
Seed	Lb.	61	0.33	20.13	100	20.13
Fertilizer, 16-20-0	Cwt.	1.4	4.80	6.72	57	3.83
Dust, 6% sulfur, 2% toxaphene	Lb.	31.7	.08	2.54	39	.99
Spray, DDT	Gal.	.5	5.90	2.95	5	.15
Irrigation fee	Applic.	1.6	1.89	3.02	100	3.02
Total	---	---	---	---	---	1/ 28.12

1/ Average yield per acre--2.2 tons. Average cost of materials per ton--$12.78, excluding container costs which were not obtained.

Table B. --Snapbeans: Labor, power, and machinery used in producing and harvesting, by operation, averages for 191 acres on 11 farms, Cameron and Hidalgo Counties, Texas, 1958-59

Operation	Type and size of equipment	Time per acre, once over		Times over, acreage covered	Percentage of total acreage covered	Time per acre, total acreage	
		Man	Power			Man	Power
		Hours	Hours	Number	Percent	Hours	Hours
Preharvest:							
Plow	2-bottom disk	1.2	1.2	1.2	66	1.0	1.0
Chisel and fertilize	5-point chisel	.3	.3	1.0	8	1/	1/
Disk	8-foot tandem	.8	.8	2.2	100	1.8	1.8
Level	10-foot float	.9	.9	1.0	50	.4	.4
List	4-row middlebuster	.8	.8	1.0	13	.1	.1
Bed and rebed	4-row bedder	.8	.8	1.3	46	.5	.5
Plant	4-row planter	.7	.6	1.0	100	.7	.6
Irrigate	---	3.6	---	1.6	100	5.8	---
Cultivate	2-row cultivator	1.2	1.2	2.7	100	3.2	3.2
Cultivate and fertilize	4-row cult. /attach.	1.0	.8	1.0	10	.1	.1
Fertilize by hand	---	6.7	---	1.0	2	.1	---
Dust	8-row duster	.4	.4	1.5	39	.2	.2
Spray	6-row boom	1.0	1.0	1.0	5	1/	1/
Weed and thin	---	5.4	---	1.0	22	1.2	---
Hoe	---	3.4	---	1.0	18	.6	---
Fertilize	4-row distributor	.3	.3	1.0	18	.1	.1
Total	---	---	---	---	---	15.8	8.0
Harvest:							
Pick by hand	---	78.0	---	1.2	2/ 17	15.9	---
Total	---	---	---	---	---	15.9	---
Total preharvest and harvest	---	---	---	---	---	3/ 31.7	3/ 8.0

1/ Less than 0.05 hour.
2/ Processor's crews harvested 83 percent of acreage. Hauling was done by processor.
3/ Average yield per acre--2.2 tons. Average labor and power used per ton--14.4 hours and 3.6 hours, respectively.

Table C. --Snapbeans: Usual labor and power inputs, Cameron and Hidalgo Counties, Texas, 1958-59

Operation	Times over	Time per acre, once over		Time per acre, total 1/	
		Man	Power	Man	Power
	Number	Hours	Hours	Hours	Hours
Plow	1	1.2	1.2	1.2	1.2
Disk	2	.8	.8	1.6	1.6
Level	1	.9	.9	.9	.9
Bed	1	.8	.8	.8	.8
Plant	1	.7	.6	.7	.6
Irrigate	2	3.6	---	7.2	---
Cultivate	3	1.2	1.2	3.6	3.6
Total	---	---	---	16.0	8.7

1/ Excludes harvesting, which is generally performed by the processor.

Table D. --Snapbeans: Distribution of workers performing specified operations, by type of worker, 11 farms, Cameron and Hidalgo Counties, Texas, 1958-59

Operation	Type of worker				
	Operator and unpaid family	Year-round hired	Local seasonal	Domestic migratory	Foreign
	Percent	Percent	Percent	Percent	Percent
Plow	43	29	0	0	28
Chisel and fertilize	100	0	0	0	0
Disk	37	18	9	0	36
Level	25	25	0	0	50
List	0	0	0	0	100
Bed and rebed	20	20	20	0	40
Plant	50	17	8	0	25
Irrigate	17	16	22	17	28
Cultivate	50	17	8	0	25
Cultivate and fertilize	0	100	0	0	0
Fertilize	100	0	0	0	0
Fertilize by hand	100	0	0	0	0
Dust	33	34	0	0	33
Spray	100	0	0	0	0
Weed and thin	50	0	0	21	29
Hoe	0	0	0	0	100
Pick by hand	0	0	33	0	67

Data presented in figure 17 and tables A, B, C, and D are based on information obtained covering production of beets for processing, on 250 acres on 11 farms in 1958-59. The average yield was 8.64 tons of topped beets.

Tractors were the chief source of power on these farms. Unless otherwise indicated, they were used for operations listed. The size of tractor was not obtained, but considering the size of equipment used, it appears that these tractors were 2- and 3-plow tractors with drawbar horsepower ratings of 15 to 30.

Most growers planted beets for canning on ground that had previously grown a highly fertilized crop. They did not fertilize the canning crop, but left it to pick up any residual fertilizer from the previous crop. While this practice definitely reduces yield, it helps keep the size of beets small and acceptable for canning as whole beets.

More than two-thirds of the growers sold unharvested beets to the canners and let the cannery have the responsibility for harvesting the crop. The farmers who did pull their beets let the canner load and haul the crop to the factory. Piece rates paid by farmers to workers for pulling beets ranged from $0.10 to $0.125 per bushel and averaged $0.11.

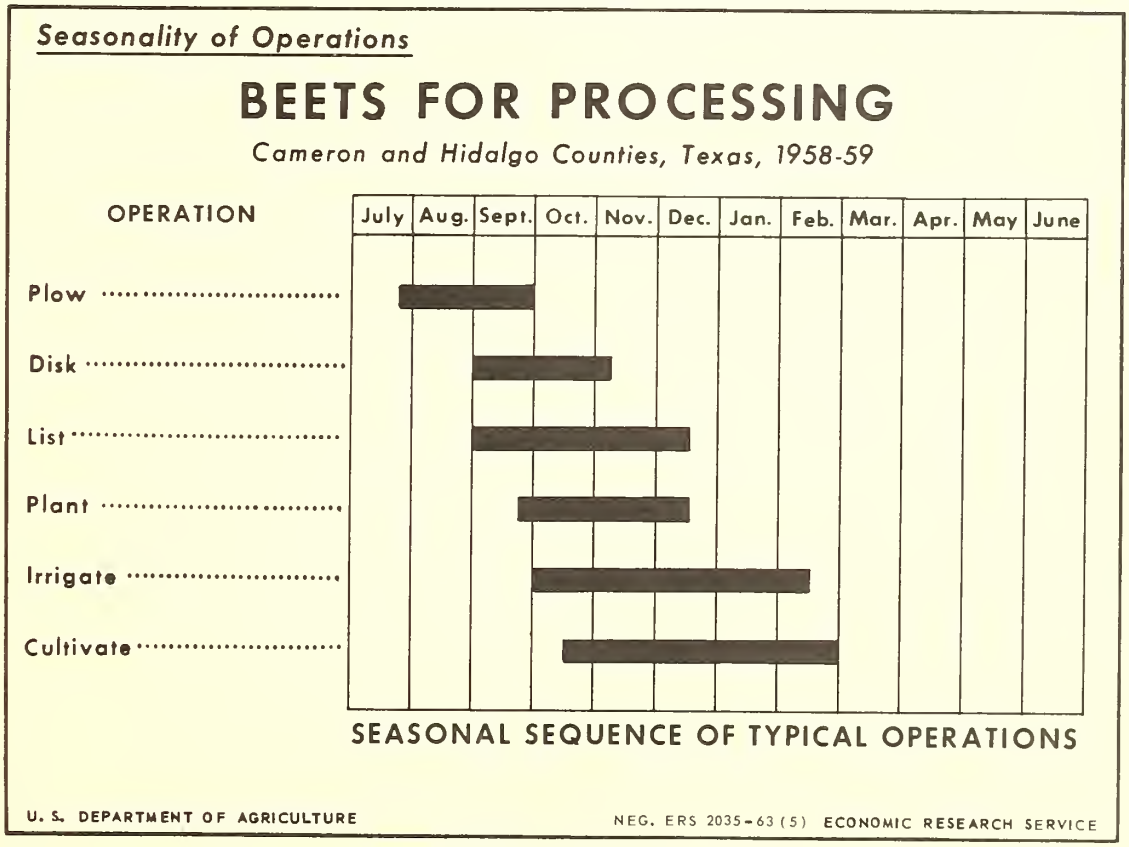

Figure 17

Table A. --Beets: Materials used and contract work hired, averages for 250 acres on 11 farms, Cameron and Hidalgo Counties, Texas, 1958-59

Item	Unit	Units per acre covered	Price per unit	Cost per acre covered	Percentage of total acreage covered	Cost per acre, total acreage
		Number	Dollars	Dollars	Percent	Dollars
Materials used:						
Seed	Lb.	10.2	1.89	19.28	100	19.28
Fertilizer, 10-20-0	Cwt.	1.4	3.74	5.24	18	.94
Irrigation fees	Acre	1.0	3.77	3.77	100	3.77
Total	---	---	---	---	---	23.99
Contract work hired:						
Plowing	Acre	1.0	5.00	5.00	10	.50
Total	---	---	---	---	---	.50
Total materials and contract work	---	---	---	---	---	1/ 24.49

1/ Average yield per acre--8.64 tons. Average cost of materials and contract work per ton--$2.83.

Table B. --Beets: Labor, power, and machinery used in producing and harvesting, by operation, averages for 250 acres on 11 farms, Cameron and Hidalgo Counties, Texas, 1958-59

Operation	Type and size of equipment	Time per acre, once over		Times over, acreage covered	Percentage of total acreage covered	Time per acre, total acreage	
		Man	Power			Man	Power
		Hours	Hours	Number	Percent	Hours	Hours
Preharvest:							
Plow (custom)	3-bottom disk plow	0.9	0.9	1.0	10	0.1	0.1
Plow	3-bottom disk plow	.9	.9	1.0	40	.4	.4
Disk	8-foot offset	.8	.8	2.4	88	1.7	1.7
Float	10-foot float	.7	.7	1.4	28	.3	.3
List	4-row lister	.5	.5	1.6	100	.8	.8
Plant	2-row seeder	1.2	.9	1.0	100	1.2	.9
Irrigate	---	4.0	---	2.1	100	8.4	---
Cultivate	2-row cultivator	1.0	1.0	3.4	100	3.4	3.4
Fertilize by hand	---	2.4	---	1.0	18	.4	---
Weed by hand	---	32.0	---	1.0	10	3.2	---
Hoe and weed by hand	---	5.9	---	1.0	18	1.1	---
Total	---	---	---	---	---	21.0	7.6
Harvest:							
Pull by hand 1/	---	82.6	---	1.0	2/ 29	24.0	---
Total	---	---	---	---	---	24.0	---
Total preharvest and harvest	---	---	---	---	---	3/ 45.0	3/ 7.6

1/ Hauling was performed with cannery crews and equipment.
2/ The remaining 71 percent of the acreage was sold to the canneries, unharvested in the field.
3/ Average yield per acre--8.64 tons. Average labor and power used per ton--5.2 hours and 0.9 hour, respectively.

Table C. --Beets: Usual labor and power inputs, Cameron and Hidalgo Counties, Texas, 1958-59

Operation	Times over	Time per acre, once over		Time per acre, total	
		Man	Power	Man	Power
	Number	Hours	Hours	Hours	Hours
Plow	1	0.9	0.9	0.9	0.9
Disk	2	.8	.8	1.6	1.6
List	2	.5	.5	1.0	1.0
Plant	1	1.2	.9	1.2	.9
Irrigate	2	4.0	---	8.0	---
Cultivate	3	1.0	1.0	3.0	3.0
Total	---	---	---	15.7	7.4

Table D. --Beets: Distribution of workers performing specified operations, by type of worker, 11 farms, Cameron and Hidalgo Counties, Texas, 1958-59

Operation	Type of worker				
	Operator and unpaid family	Year-round hired	Local seasonal	Foreign	Custom
	Percent	Percent	Percent	Percent	Percent
Plow	17	33	17	16	17
Disk	37	27	36	0	0
Float	0	67	0	33	0
List	38	33	21	8	0
Plant	27	20	33	20	0
Irrigate	17	12	38	33	0
Cultivate	33	25	25	17	0
Fertilize	0	100	0	0	0
Weed	0	0	100	0	0
Hoe and weed	0	0	10	90	0
Pull beets	0	0	31	69	0

Data in figure 18 and tables A, B, C, and D are based on information covering the production and harvesting of carrots for processing, grown on 273 acres on 11 farms in 1958-59. The average per acre yield of topped carrots was 4.29 tons.

Tractors were the main source of power on these farms. Unless otherwise indicated, they were used for operations listed. Size of tractor was not obtained in the survey, but considering the size of equipment used, it appears that these tractors were 2- and 3-plow tractors with drawbar horsepower ratings of 15 to 30.

Growers producing carrots for processing are reducing labor inputs by the use of herbicides. Naptha was applied to 63 percent of the acreage. No longer is it necessary to weed and hoe 2 or 3 times per season. In conjunction with the application of a herbicide, the weeding operation was performed only one time per acre. On one-fourth of the acreage, weeding was not done at all.

In harvesting carrots for processing, about two-thirds of the acreage was plowed out by farmers and only 22 percent of the total acreage was topped by farm crews. Processors' crews performed the remaining harvest operations.

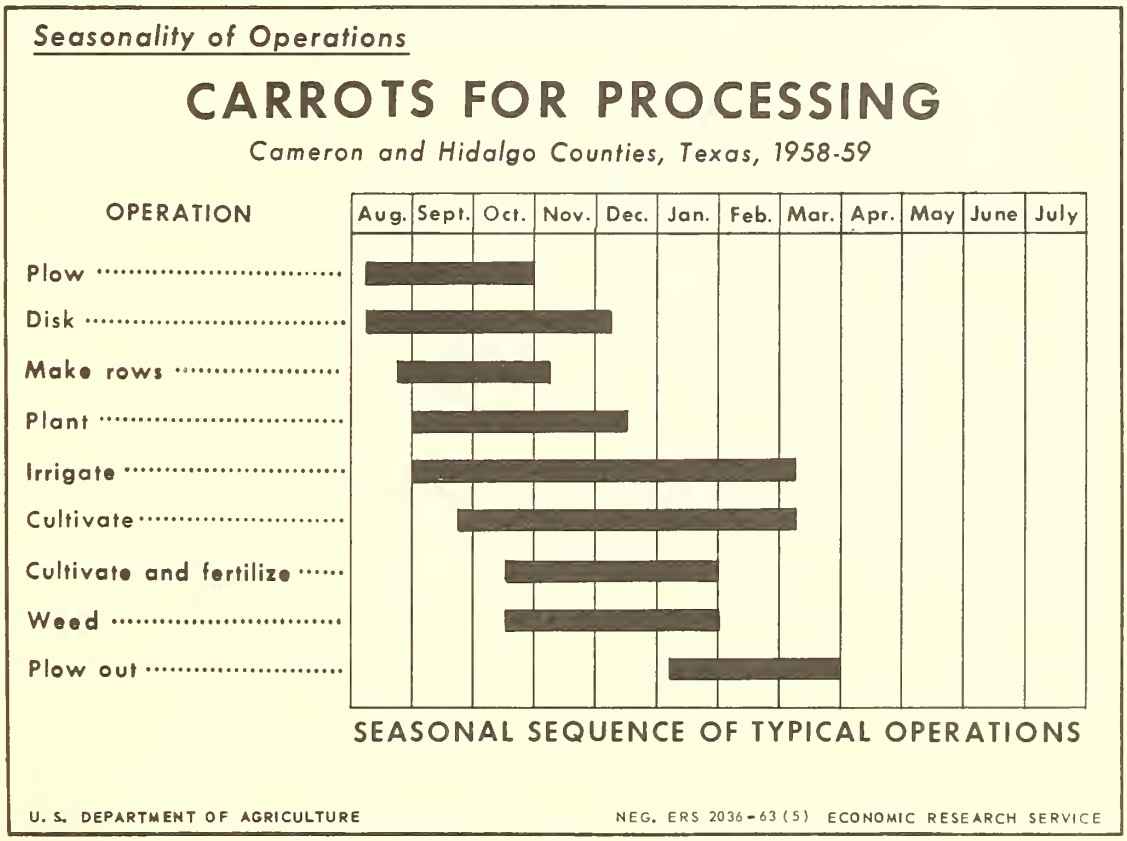

Figure 18

Table A.--Carrots: Materials used and contract work hired, averages for 273 acres on 11 farms, Cameron and Hidalgo Counties, Texas, 1958-59

Item	Unit	Units per acre covered	Price per unit	Cost per acre covered	Percentage of total acreage covered	Cost per acre, total acreage
		Number	Dollars	Dollars	Percent	Dollars
Materials used:						
Seed	Lb.	1.4	1.70	2.38	100	2.38
Fertilizer, 82% N	Cwt.	1.14	5.50	6.27	75	4.70
Spray, naptha	Gal.	72.2	.21	15.16	13	1.97
Irrigation fees	Applic.	2.2	1.93	4.25	100	4.25
Total	---	---	---	---	---	13.30
Contract work hired:						
Spray by plane, materials included	Applic.	1.0	14.24	14.24	43	6.12
Spray by tractor boom, materials included	Applic.	1.0	10.00	10.00	7	.70
Total	---	---	---	---	---	6.82
Total materials and contract work	---	---	---	---	---	1/ 20.12

1/ Average yield per acre--4.29 tons. Average cost of materials and contract work per ton--$4.69.

Table B. --Carrots: Labor, power, and machinery used in producing and harvesting, by operation, averages for 273 acres on 11 farms, Cameron and Hidalgo Counties, Texas, 1958-59

Operation	Type and size of equipment	Time per acre, once over		Times over, acreage covered	Percentage of total acreage covered	Time per acre, total acreage	
		Man	Power			Man	Power
		Hours	Hours	Number	Percent	Hours	Hours
Preharvest:							
Plow	3-bottom disk	0.8	0.8	1.0	65	0.5	0.5
Disk	7-foot tandem	.7	.7	2.4	63	1.1	1.1
List	4-row lister	.5	.5	1.0	37	.2	.2
Float	10-foot landplane	.5	.5	1.1	39	.2	.2
Make rows	4-row middlebuster	.6	.6	1.2	54	.4	.4
Plant	2-row seeder	1.2	.7	1.0	100	1.2	.7
Irrigate	---	2.6	---	2.2	100	5.7	---
Cultivate	2-row cultivator	.8	.8	4.1	100	3.3	3.3
Cultivate and fertilize	4-row cultivator/attach.	.6	.6	1.0	50	.3	.3
Spray	8-row boom	.4	.4	1.8	13	.1	.1
Weed	---	12.9	---	1.0	75	9.7	---
Hoe	---	8.1	---	1.5	18	2.2	---
Fertilize by hand	---	1.0	---	1.0	15	.2	---
Fertilize	2-row distributor	.7	.7	1.0	10	.1	.1
Spray (custom)	Plane	1/	1/	1.0	43	1/	1/
Spray (custom)	8-row boom sprayer	.3	.3	1.0	7	1/	1/
Total	---	---	---	---	---	25.2	6.9
Harvest:							
Plow out	2-row carrot plow	1.0	1.0	1.0	68	.7	.7
Top by hand	---	46.7	---	1.0	22	10.3	---
Total	---	---	---	---	---	11.0	.7
Total preharvest and harvest	---	---	---	---	---	2/ 36.2	2/ 7.6

1/ Less than 0.05 hour.

2/ Average yield per acre--4.29 tons. Average labor and power used per acre--8.4 hours and 1.8 hours, respectively.

Table C. --Carrots: Usual labor and power inputs, Cameron and Hidalgo Counties, Texas, 1958-59

Operation	Times over	Time per acre, once over		Time per acre, total	
		Man	Power	Man	Power
	Number	Hours	Hours	Hours	Hours
Plow	1	0.8	0.8	0.8	0.8
Disk	2	.7	.7	1.4	1.4
Make rows	1	.6	.6	.6	.6
Plant	1	1.2	.7	1.2	.7
Irrigate	2	2.6	---	5.2	---
Cultivate	4	.8	.8	3.2	3.2
Cultivate and fertilize	1	.6	.6	.6	.6
Weed	1	12.9	---	12.9	---
Plow out	1	1.0	1.0	1.0	1.0
Total	---	---	---	26.9	8.3

Table D. --Carrots: Distribution of workers performing specified operations, by type of worker, 11 farms, Cameron and Hidalgo Counties, Texas, 1958-59

Operation	Type of worker			
	Operator and unpaid family	Year-round hired	Local seasonal	Foreign
	Percent	Percent	Percent	Percent
Plow	60	20	20	0
Disk	42	8	17	33
List	100	0	0	0
Float	100	0	0	0
Make rows	78	11	11	0
Plant	63	6	25	6
Irrigate	27	8	12	53
Cultivate	54	8	23	15
Cultivate and fertilize	100	0	0	0
Spray 1/	100	0	0	0
Weed	0	0	79	21
Hoe	54	0	0	46
Fertilize	100	0	0	0
Fertilize by hand	0	0	100	0
Plow out	80	0	20	0
Top	0	0	100	0

1/ Excludes custom operations.

Figure 19 and tables A, B, C, and D were prepared from information covering production of tomatoes for processing, on 484 acres on 9 farms in 1958-59. The average yield per acre was 4.3 tons.

Tractors were the chief source of power on these farms. Unless otherwise indicated, they were used for operations listed. While information as to size of tractor was not obtained, the size of equipment used would indicate the average tractor to be a 2-plow tractor with a drawbar horsepower rating of 15 to 20.

Most of the land preparation is done late in summer and fall, but the bulk of the acreage is not planted until December and January. Acreage planted in November had to be replanted when frosts early in December killed the young plants. Plants not killed were set back and did not come into production much before those seeded in December and January.

Only one grower reported selling his crop unharvested in the field. The remainder reported picking the crop, but did not report any loading and hauling to canneries.

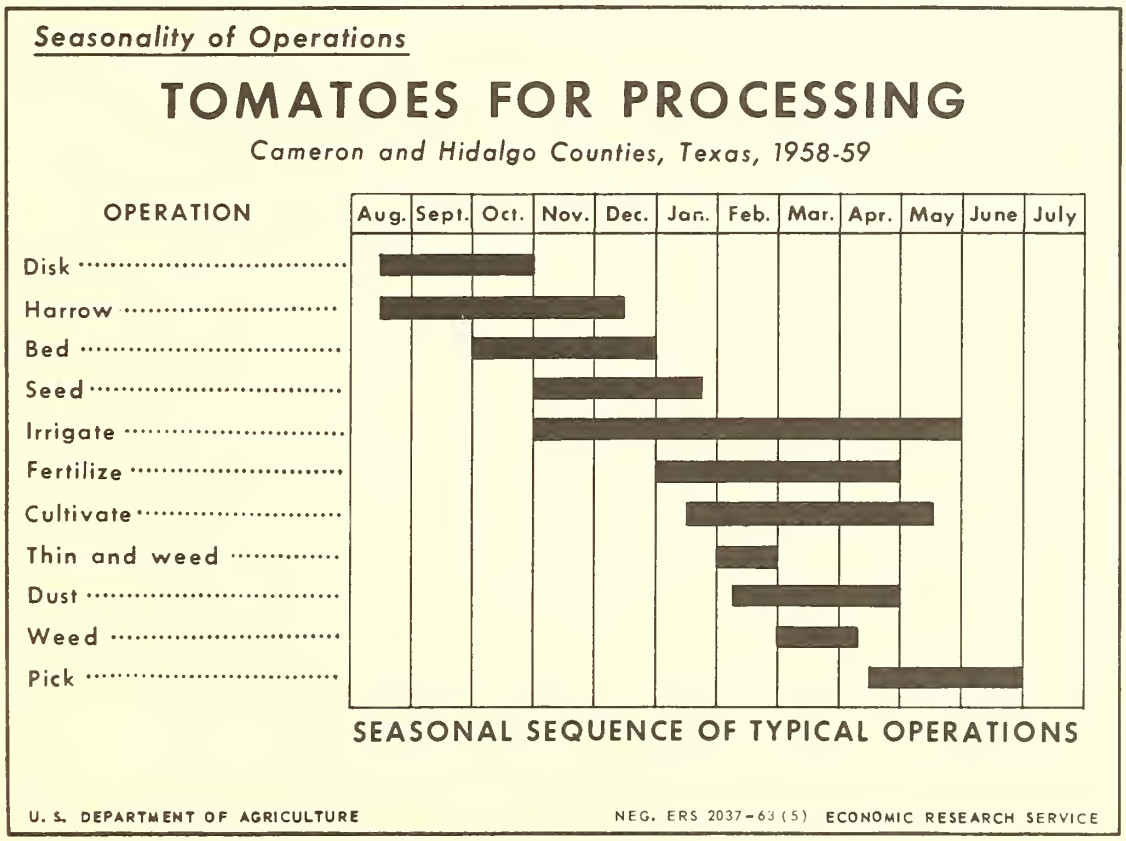

Figure 19

Table A.--Tomatoes: Materials used, averages for 484 acres on 9 farms, Cameron and Hidalgo Counties, Texas, 1958-59

Materials used	Unit	Units per acre covered	Price per unit	Cost per acre covered	Percentage of total acreage covered	Cost per acre, total acreage
		Number	Dollars	Dollars	Percent	Dollars
Seed	Lb.	1.1	4.87	5.36	100	5.36
Fertilizer, 33-0-0	Cwt.	2.6	3.92	10.19	96	9.78
Fertilizer, 16-20-0 liquid	Gal.	10	.80	8.00	63	5.04
Irrigation water	Acre	3.2	2.48	7.94	100	7.94
Dust, toxaphene	Lb.	98.8	.17	16.80	98	16.46
Spray, parathion-toxaphene	Qt.	2.1	.50	1.05	4	.04
Total	---	---	---	---	---	1/ 44.62

1/ Average yield per acre--4.3 tons. Average cost of materials used per ton--$10.38, excluding container costs which were not obtained.

Table B. --Tomatoes: Labor, power, and machinery used in producing and harvesting, by operation, averages for 484 acres on 9 farms, Cameron and Hidalgo Counties, Texas, 1958-59

Operation	Type and size of equipment	Time per acre, once over		Times over, acreage covered	Percentage of total acreage covered	Time per acre, total acreage	
		Man	Power			Man	Power
		Hours	Hours	Number	Percent	Hours	Hours
Preharvest:							
Deep plow	2-disk plow	3.4	3.4	1.0	32	1.1	1.1
Chisel	7-point chisel	1.1	1.1	1.2	9	.1	.1
Disk	7-foot tandem	1.2	1.2	2.5	100	3.0	3.0
Harrow	2-section spiketooth	.6	.6	1.0	68	.4	.4
Float	8-foot float	.8	.8	1.0	4	1/	1/
Bed	4-row bedder	.5	.5	1.0	70	.4	.4
Seed	2-row seeder	1.1	1.1	1.1	100	1.2	1.2
Irrigate 2/	---	2.4	---	3.2	100	7.7	---
Fertilize	2-row distributor	1.0	.5	1.9	69	1.3	.7
Fertilize by hand	---	4.3	---	1.5	3	.2	---
Cultivate and fertilize	2-row cult. /attach.	1.5	1.5	1.0	25	.4	.4
Cultivate	2-row cultivator	1.0	1.0	5.3	100	5.3	5.3
Hoe	---	4.9	---	3.5	32	5.5	---
Thin and weed	---	6.4	---	1.0	75	4.8	---
Weed	---	4.9	---	1.0	86	4.2	---
Dust	6-row duster	.4	.4	3.4	97	1.3	1.3
Dust by hand	---	4.0	---	1.0	1	1/	---
Spray	8-row boom	.8	.8	1.0	4	1/	1/
Total	---	---	---	---	---	36.9	13.9
Harvest:							
Pick by hand 3/	---	15.3	---	4.6	95	66.9	---
Total preharvest and harvest	---	---	---	---	---	4/ 103.8	4/ 13.9

1/ Less than 0.05 hour.
2/ Includes some fertilizing with liquid fertilizer.
3/ No growers reported loading and hauling. Production on 5 percent of the acreage was sold unharvested in the field.
4/ Average yield per acre--4.3 tons. Average labor and power used per tow--24.1 hours and 3.2 hours, respectively.

Table C. --Tomatoes: Usual labor and power inputs, Cameron and Hidalgo Counties, Texas, 1958-59

Operation	Times over	Time per acre, once over		Time per acre, total	
		Man	Power	Man	Power
	Number	Hours	Hours	Hours	Hours
Disk	2	1.2	1.2	2.4	2.4
Harrow	1	.6	.6	.6	.6
Bed	1	.5	.5	.5	.5
Seed	1	1.1	1.1	1.1	1.1
Irrigate	3	2.4	---	7.2	---
Fertilize	2	1.0	.5	2.0	1.0
Cultivate	5	1.0	1.0	5.0	5.0
Thin and weed	1	6.4	---	6.4	---
Weed	1	4.9	---	4.9	---
Dust	3	.4	.4	1.2	1.2
Pick	4.6	15.3	---	70.4	---
Total	---	---	---	101.7	11.8

Table D. --Tomatoes: Distribution of workers performing specified operations, by type of worker, 9 farms, Cameron and Hidalgo Counties, Texas, 1958-59

Operation	Type of worker				
	Operator and unpaid family	Year-round hired	Local seasonal	Domestic migratory	Foreign
	Percent	Percent	Percent	Percent	Percent
Deep plow	50	0	25	0	25
Chisel	40	0	60	0	0
Disk	42	0	33	0	25
Harrow	35	0	46	0	19
Float	100	0	0	0	0
Bed	50	0	33	0	17
Seed	46	0	27	0	27
Irrigate	25	0	21	25	29
Fertilize	60	0	40	0	0
Fertilize by hand	33	0	0	0	67
Cultivate and fertilize	0	0	33	0	67
Cultivate	50	0	25	0	25
Hoe	18	0	78	0	4
Thin and weed	5	0	64	29	2
Weed	0	0	33	67	0
Dust	45	0	22	0	33
Dust by hand	50	0	0	0	50
Spray	50	0	50	0	0
Pick by hand	0	0	14	1	85