

GUIDE LINES

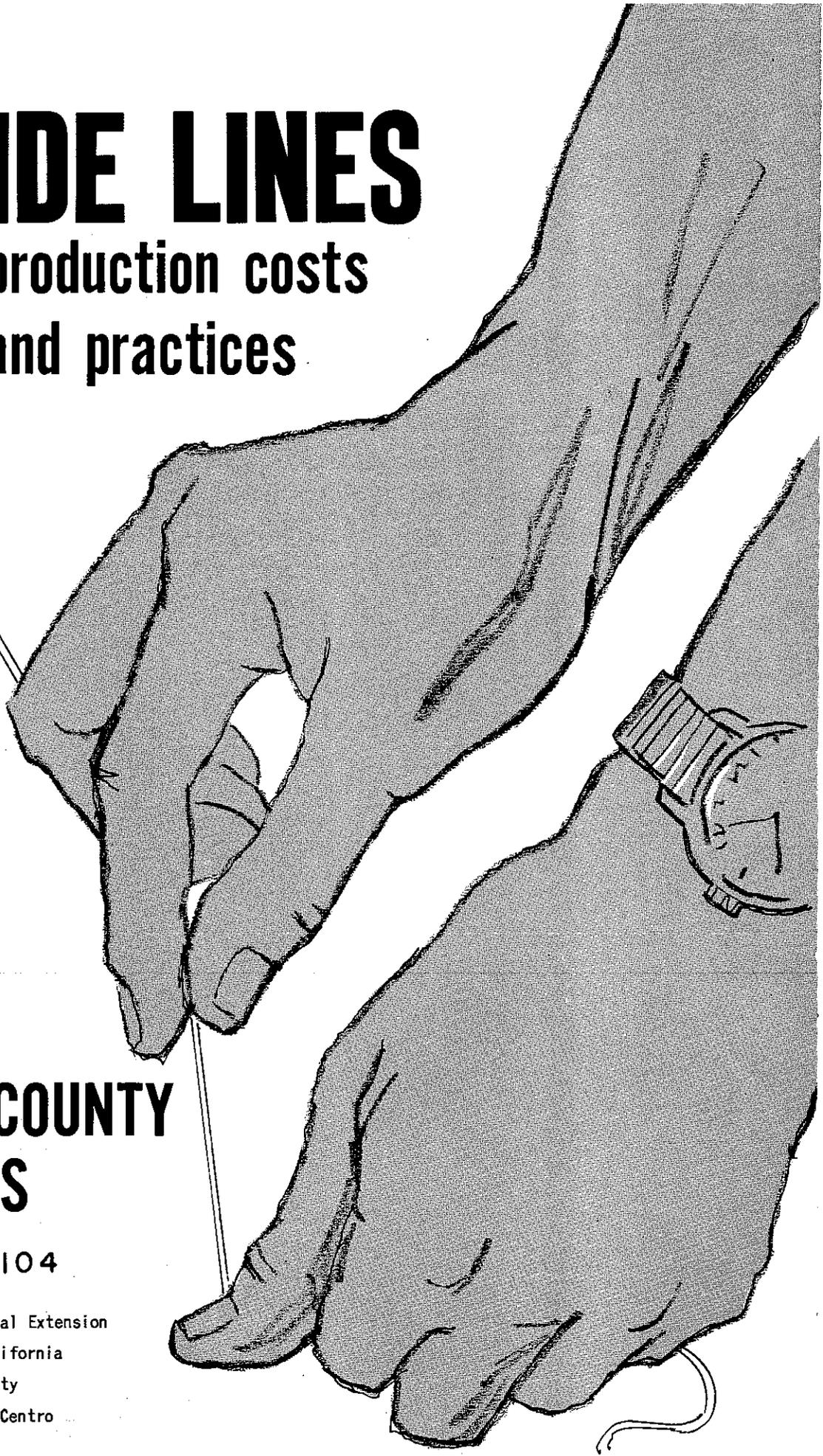
**to production costs
and practices**

1979

IMPERIAL COUNTY CROPS

Circular 104

Cooperative Agricultural Extension
University of California
Imperial County
Court House, El Centro



A U T H O R S

ROBERT W. HAGEMANN - Field Crops: Alfalfa, Sugar Beets,
Oil Crops.

DEMETRIOS G. KONTAXIS - Plant Pathology and Nematology

KEITH S. MAYBERRY - Vegetable Crops: Lettuce, Melons and
Miscellaneous Vegetables.

DOLORES W. PAINTER - Field Crops: Cotton, Cereal Grain,
Grain Sorghum.

ADOLPH F. VAN MAREN - Administration, Vegetable Crops

Revised January 1979

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FOREWORD

The following projected production costs are only a guide for making management decisions. Growers are encouraged to pencil in their own cost inputs and make comparisons.

Individual fields may vary in production costs as much as 20-25% due to variations in pest control, weed control and fertilizer practices; time of planting; weather conditions; soils, etc.

Most equipment and cultural operations are charged on a custom basis; thus, these production costs should not necessarily be related to size of operations or acreage involved. Contract rates or charges include repair and maintenance, operating costs, interest, overhead, depreciation, and labor. Estimated costs in these guidelines would normally be applied to farm sizes 640 acres and over.

A particular cultural operation (such as use of sprinklers, coated seed, etc.) is included in the itemized costs only when the operation is used on more than 50 percent of the acreage.

Overhead expense includes such items as utilities, office, insurance, interest charges, supplies, accounting charges, supervisor's salaries and transportation, income to management, and other administrative expenses.

Land rent is for the single crop only and all costs are based on net acres. Piece-rate wages incurred during harvest are included in overall harvest costs.

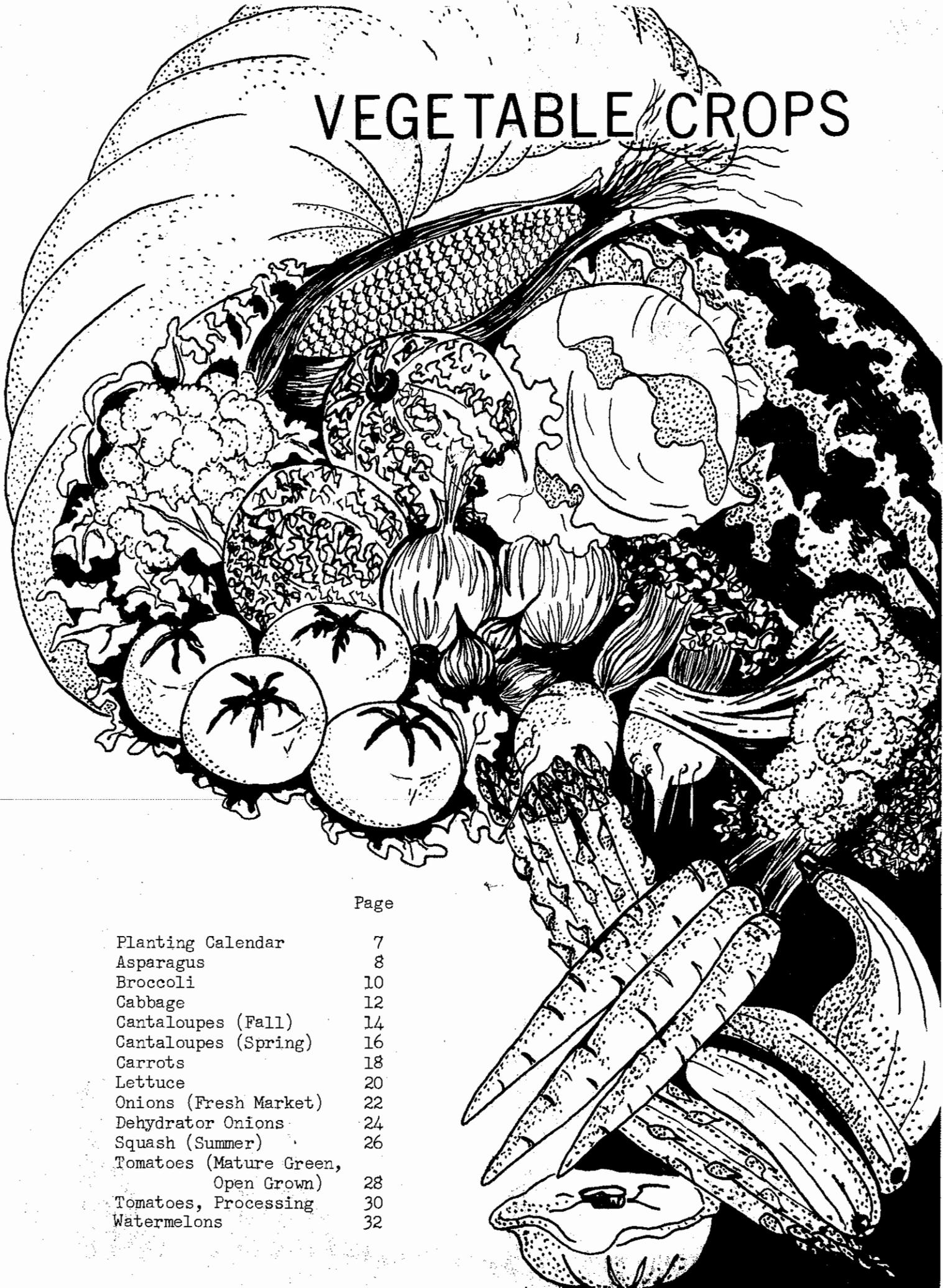
If you have suggestions for making these guidelines more useful, do not hesitate to contact us.

Sincerely yours,



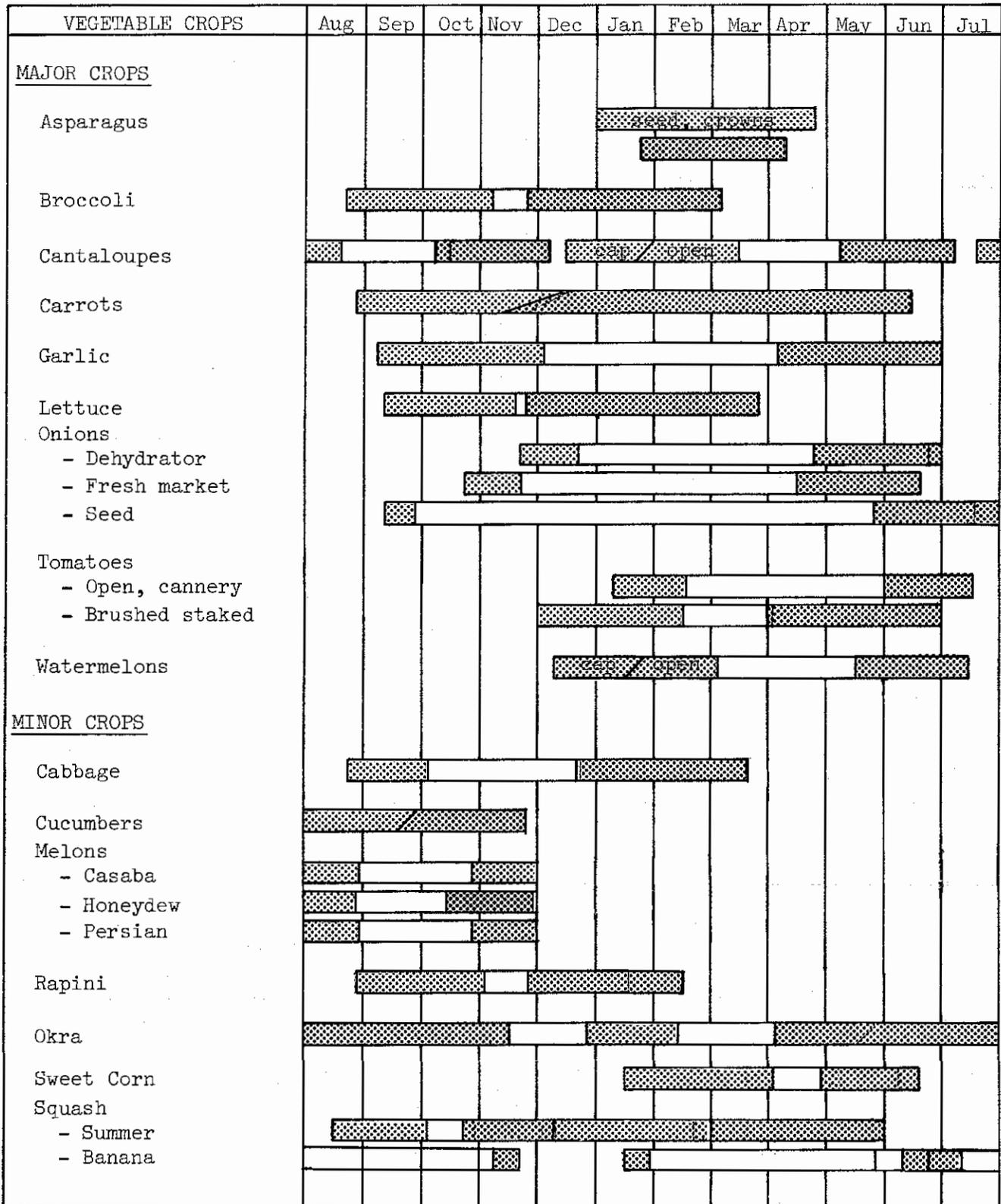
Adolph F. Van Maren
County Director and Farm Advisor

VEGETABLE CROPS



	Page
Planting Calendar	7
Asparagus	8
Broccoli	10
Cabbage	12
Cantaloupes (Fall)	14
Cantaloupes (Spring)	16
Carrots	18
Lettuce	20
Onions (Fresh Market)	22
Dehydrator Onions	24
Squash (Summer)	26
Tomatoes (Mature Green, Open Grown)	28
Tomatoes, Processing	30
Watermelons	32

SCHEDULE OF MAJOR CROPS - PLANTING AND HARVEST - IMPERIAL VALLEY



Preparation & planting  Cultivation, growth & lay-by  Harvest 

Seed Crops follow seasonal cropping.

Cattle feeding is a major operation throughout the year.

Lamb feeding - October through March.

DIRECT SEEDED ASPARAGUS--PROJECTED PRODUCTION COSTS--1979

Mechanical operations at custom rates. Field hand labor at \$4.75 per hour (\$3.70 plus Social Security, unemployment insurance, transportation, supervision and fringe benefits).

Yield--140 30-lb. crates from an established field. (2.2 tons)

OPERATION	Custom Rate	1st Year	2nd Year	3rd Year
LAND PREPARATION				
Plow	\$15.75	\$ 15.75		
Disc 4x	5.50	22.00		
Landplane 3x	6.75	20.25		
Border--cross check	9.00	9.00		
Flood	3/4 ac. ft.	13.25*		
Float	5.00	5.00		
Fertilize	4.50, 6.50	56.00		
List--shape beds	13.00	13.00		
TOTAL LAND PREPARATION		\$154.25		
GROWING PERIOD				
Plant (10# @ \$15.00/#)	\$12.50	\$162.50		
Cultivate 3x	6.50	19.50		
Fertilize 2x	6.50	48.00		
Sprinkler irrigate	87.50	87.50		
Irrigate 8x		50.50*		
Hand weed control		150.00	\$ 20.00	\$ 20.00
Pest control 2x	4.00	25.00	44.00	44.00
Chemical weed control 2x	4.50	30.00	35.00	35.00
Chop Fern*	6.80		6.80	6.80
Rolling Cultivator 2x	6.00		12.00	12.00
Rotovate & shape beds	13.00		13.00	13.00
Fertilize 3x	6.50		105.00	105.00
Irrigate 15x			70.00*	70.00*
GROWING PERIOD		\$573.00	\$ 305.80	\$ 305.80
GROWING PERIOD & LAND PREPARATION COSTS		\$727.25	\$ 305.80	\$ 305.80
Land Rent (new lease)		150.00	150.00	150.00
Amortization ^{1/}		0.00	96.50	96.50
Cash Overhead--10% of preharvest costs & land rent ^{2/}		87.72	45.58	45.58
TOTAL PREHARVEST COSTS		\$964.97	\$ 597.88	\$ 597.88
HARVEST				
Cut, haul to shed, pack, cool, sell @ 13.50			\$ 540.00	\$1890.00
TOTAL ALL COSTS		\$964.97	\$1137.88	\$2487.88

Cost per crate--140 crates = \$17.77
Cost per crate--175 crates = \$16.92

- ^{1/} Amortize first year's establishment costs over 10-year period.
 Begin amortization in second year.
^{2/} Excluding amortization cost. Light cut second year.

* Includes shovel labor, pipe setting, miscellaneous tractor work.

DIRECT SEEDED ASPARAGUS

1979

<u>YEAR</u>	<u>ACRES</u>	<u>YIELD/ACRE (TONS)</u>	<u>VALUE/TON</u>
1973	4,500	1.91	\$ 678.14
1974	4,600	1.63	887.74
1975	4,400	1.91	1050.24
1976	4,270	1.80	1129.34
1977	3,400	1.65	1478.33

PLANTING: Direct seeding is best done January through April. Eight to twelve pounds of seed per acre has been satisfactory. Presently 2-4 rows are planted on a 30-inch bed top. Beds center to center are 60 inches. Seed depth is from 1-1½ inches. Germination irrigation follows. It is desirable to have an in-row plant spacing of at least four inches.

VARIETIES: The main varieties grown are 500W, UC72, Brock selections and UC Hybrid 157.

SOILS: Well-drained sandy loams and loams are best for asparagus.

IRRIGATION: Timing and method of application are very important during harvest season. Every other row irrigation will maintain even production. Over 15 irrigations per year will not be unusual. Irrigation interval during the summer is from 10 to 15 days.

FERTILIZERS: From 100 to 200 pounds of phosphate and 200 to 600 pounds of nitrogen are used. All of the phosphate and at least one-third of the nitrogen is applied in winter before the cutting season. The remaining nitrogen is applied during and after the harvest season.

PESTS AND DISEASES: Consult the University of California farm advisors for latest list of registered chemicals for pests and diseases.

HARVESTING: Spears are hand cut from mid-January through mid-April. Only the most vigorous plants should be cut during the second season for a two-four week period. Overcutting will lead to a decline in production and small spears. During the third year of growth, cutting may be continued the full season--about 60 days. Spears are cut at an angle just below the soil surface with an asparagus knife. They are cut every two or three days early in the season, but during warm weather the field will be cut each day. The harvested spears are hauled to shed for grading, trimming, packing and cooling.

REMARKS: Currently close to 50 percent of the fern acreage is cut with a regular alfalfa swather, baled, and stacked for livestock feed in December. The additional cost per acre is approximately \$45.00 minus \$6.80. The additional revenue from the baled fern has not been established.

BROCCOLI--PROJECTED PRODUCTION COSTS--1979

Mechanical operations at custom rates. Hand labor at \$4.75 per hour (\$3.70 plus Social Security, unemployment insurance, transportation, supervision and fringe benefits).

Yield--300 40-lb. cartons. (6 tons projected). 85-110 days to maturity.

OPERATION	Custom Rate	MATERIALS		HAND LABOR*		SAMPLE COSTS Per Acre
		Type	Cost	Hours	Dollars	
LAND PREPARATION						
Subsoil	16.50					\$ 16.50
Disc 2x	5.50					11.00
Border, cross check & break borders	9.00					9.00
Flood		Water .75 ac ft	3.75	1	4.75*	8.50
Fertilize	3.25	400# Preplant 11-48-0	36.00			39.25
Disc 2x	5.50					11.00
Triplane 2x	5.75					11.50
List	6.50					6.50
TOTAL LAND PREPARATION						\$ 113.25
GROWING PERIOD						
Herbicide 1x	3.50	Dacthal®	14.00			\$ 17.50
Plant (Precision)	8.50	Hybrid seed 1 1/2# @ 60.00	90.00			98.50
Sprinkler Irrigate		Rent	40.00	10	47.50	87.50
Thin				8	38.00	38.00
Cultivate 3x	6.50					19.50
Fertilize & furrow out 1x	6.00	80# N @ 25¢	20.00			26.00
Weed				4	19.00	19.00
Irrigate 8x		4 1/2 ac ft	22.50	8	38.00*	60.50
Pest Control 8x	3.50	Insecticides	60.00			88.00
GROWING PERIOD						\$ 454.50
GROWING PERIOD & LAND PREPARATION COSTS						\$ 567.75
Land Rent (new lease)						150.00
Cash Overhead--10% of preharvest costs & land rent						71.77
TOTAL PREHARVEST COSTS						\$ 789.52
HARVEST						
Custom harvest, pack haul to cooler		300 40-lb. cartons @ 3.20				\$ 960.00
TOTAL ALL COSTS						\$1749.52

Cost per 40-lb. carton = \$5.83 @ 300 ctn/Ac

* Includes shovel labor, pipe setting and miscellaneous tractor work.

PLANTING DATES: Broccoli is normally planted from August 25-November 1. Harvesting begins November 25 and continues through March 5. Broccoli will germinate at temperatures of 40-95 F.

VARIETIES: Green Duke hybrid is the major variety grown. Small acreages of other varieties are being grown such as Futura and Gem. The seed is planted 1/8 - 1/4 inch deep, commonly 8-inch spacings are used in row.

SOILS: Well-drained soils are preferred, although broccoli may be grown on a wide range of textures. Broccoli has greater salt tolerance than does lettuce, carrots or onions.

IRRIGATION: Normally broccoli is irrigated 6 to 8 times during the season. Sprinkler irrigation is normally used for stand establishment.

FERTILIZERS: Four hundred pounds of 0-45-0 or 11-48-0 are normally broadcast prior to listing the beds. About 80 lbs. of nitrogen is applied in one sidedress application.

WEED CONTROL: Several herbicides are available for application preplant. Consult your weed control farm advisor for further information.

PESTS AND DISEASES: Cabbage loopers, armyworms, salt marsh caterpillars, cutworms, sugar beet nematodes, flea beetles and aphids can cause extensive damage unless controlled. For the latest information on insect control along with precautions on use of insecticides, consult your entomology farm advisor.

HARVESTING: Fields are harvested once or twice during the season. Broccoli heads are hand cut with 10-12 inch stalks and placed on a belt loader. Trucks haul the bulk bins to the shed for sorting, trimming and bunching. The broccoli is packed in 40 pound fiberboard cartons containing 14-18 bunches.

CABBAGE--PROJECTED PRODUCTION COSTS--1979

Mechanical operations at custom rates. Hand labor at \$4.75 per hour (\$3.70 plus Social Security, unemployment insurance, transportation, supervision and fringe benefits).

Yield--550 55-lb. cartons per acre. (15 tons) 60-100 days to maturity.

OPERATIONS	Custom Rate	MATERIALS		HAND LABOR*		SAMPLE COSTS Per Acre
		Type	Cost	Hours	Dollars	
LAND PREPARATION						
Subsoil	16.50					\$ 16.50
Disc 2x	5.50					11.00
Border, cross check & break borders	9.00					9.00
Flood		Water .75 ac ft	3.75	1	4.75*	8.50
Fertilize	3.25	400# Preplant 11-48-0	35.00			39.25
Disc 2x	5.50					11.00
Triplane 2x	5.75					11.50
List	6.50					6.50
TOTAL LAND PREPARATION						\$ 113.25
GROWING PERIOD						
Herbicide 1x	3.50	Prefar®	14.00			\$ 17.90
Plant (Precision)	8.50	Hybrid seed 2# @ 45.00	90.00			98.50
Sprinkler Irrigate		Rent	40.00	10	47.50	87.50
Thin				11	52.25	52.25
Cultivate 3x	6.50					19.50
Fertilize and furrow out 3x	6.00	200# N @ 25¢	50.00			68.00
Weed				6	28.50	28.50
Irrigate 8x		4 1/2 ac ft	22.50	8	38.00*	60.50
Pest Control 10x	3.50	Insecticides	90.00			125.00
GROWING PERIOD						\$ 557.65
GROWING PERIOD & LAND PREPARATION COSTS						\$ 670.90
Land Rent (new lease)						150.00
Cash Overhead--10% of preharvest costs and land rent						82.09
TOTAL PREHARVEST COSTS						\$ 902.99
HARVEST						
Custom harvest, pack haul to cooler						\$1210.00
550 55-lb. cartons @ 2.20						\$1210.00
TOTAL ALL COSTS						\$2112.99

Cost per carton = \$3.84 @ 550 ctn/Ac
Cost per carton = \$3.49 @ 700 ctn/Ac

* Includes shovel labor, pipe setting and miscellaneous tractor work.

CABBAGE CULTURE

1979

<u>YEAR</u>	<u>ACRES</u>	<u>YIELD/ACRE</u>	<u>VALUE/TON</u>
1972	620	12.26	\$ 86.97
1973	470	14.04	93.79
1974	1200	10.25	65.04
1975	330	16.06	102.45
1976	317	7.50	90.06

YIELDS: Yields of 800 cartons per acre are occasionally produced. Total yields are influenced by market conditions at harvest time. Several cuttings are common.

PLANTING: Most acreage is planted from September 10-25 on 42" beds with two rows per bed. Seed is planted 1/8 to 1/4 inch deep at a seeding rate of 2 pounds per acre. Plants are thinned 12 to 14 inches apart. Cabbage seed will germinate between 40-95 F. (Optimum 85 F) Stubble discing (\$12.00/A) may be necessary to decompose the previous crop.

VARIETIES: Only early maturing varieties for the fresh market are planted. Varietal strains of Headstart, Banner and Golden Acre predominate. Hybrid seed sell for \$45.00 per pound whereas open pollinated lines run about \$6-7.00 per pound. In warm weather, cabbage tends to bolt producing soft elongated heads.

SOIL: A medium textured soil with good drainage and good water holding capacity is desirable. Lighter soils are easier to manage during the colder months than heavy ones. Cabbage has a greater salt tolerance than lettuce, carrots, or onions.

IRRIGATION: At no time after thinning should plants be stressed for water. Normally, 6 to 8 irrigations are adequate. The irrigation labor costs also include shovel work, pipe setting and grader expense.

FERTILIZERS: All the phosphate fertilizer should be broadcast before listing. Apply the additional nitrogen in two sidedressing.

WEED CONTROL: Several herbicides are registered for use on cabbage. These are applied preemergence. Consult the weed control farm advisor for further information.

PEST AND DISEASES: Cabbage diseases cause relatively little damage in Imperial County. Intumescences can occur as wart-like projections on leaves as the result of sand blasting. Damping off at the seedling stage may also be a problem.

Cabbage loopers, armyworms, salt marsh caterpillars, cutworms, sugar beet nematodes, flea beetles and aphids can cause extensive damage unless controlled. For the latest information on insect control along with precautions on the use of insecticides, consult your entomology farm advisor.

HARVESTING: Fields are harvested from one to several times December through March. Heads are cut, trimmed, and packed in the field; or cut, loaded into wagons, and hauled to packing sheds near the fields.

FALL CANTALOUPE--PROJECTED COSTS--1979

Mechanical operations at custom rates. Hand labor at \$4.75 per hour (\$3.70 plus Social Security, unemployment insurance, transportation, supervision and fringe benefits).

Yield--175 crates per acre (7.5 tons). 85-90 days to maturity.

OPERATION	Custom Rate	MATERIALS		HAND LABOR*		SAMPLE COSTS Per Acre
		Type	Cost	Hours	Dollars	
LAND PREPARATION						
Subsoil	16.50					\$ 16.50
Disc 2x	5.50					11.00
Border, cross check & break borders	9.00					9.00
Flood		Water 3/4 ac ft	3.75	1	4.75*	8.50
Fertilize	2.50	200# 11-48-0	18.00			20.50
Disc 2x	5.50					11.00
TOTAL LAND PREPARATION						\$ 76.50
GROWING PERIOD						
Run flat beds	6.50					\$ 6.50
Plant	5.00	Seed 1 1/2# @ 5.35/#	8.00			13.00
Thin				5	23.75	23.75
Cultivate 2x	6.50					13.00
Fertilize & furrow out 1x	6.00	60# N @ 25¢	15.00			21.00
Pollination		Hives 1 1/2 @ 11.00	16.50			16.50
Weed 1x				4	19.00	19.00
Irrigate 3x		Water 2 ac ft	10.00	8	38.00*	48.00
Pest Control 5x	3.50	Pesticides, Fungicides	40.00			57.50
TOTAL GROWING PERIOD						\$ 218.25
GROWING PERIOD & LAND PREPARATION COSTS						\$ 294.75
Land Rent						120.00
Cash Overhead--10% of preharvest costs & land rent						41.47
TOTAL PREHARVEST COSTS						\$ 456.22
HARVEST						
Pick, haul, pack & crate 175 crates @ 5.50						\$ 962.50
TOTAL ALL COSTS						\$1418.72

Cost per crate = \$8.10 @ 175 crates/Ac
Cost per crate = \$7.78 @ 200 crates/Ac

* Includes shovel labor, pipe setting and miscellaneous tractor work.

<u>YEAR</u>	<u>ACRES</u>	<u>YIELD/ACRE (TONS)</u>	<u>VALUE/TON</u>
1973	9,500	6.95	\$ 189.45
1974	8,300	7.53	221.95
1975	7,400	5.32	280.94
1976	8,850	6.37	249.48
1977	9,440	6.56	214.87

PLANTING DATES: The fall crop is generally planted during the last two weeks of July through the first two weeks in August for harvest in mid-October and November. The melons are planted on flat beds to reduce sun exposure.

VARIETIES: Nearly all of the acreage is planted to Topmark. The remainder of the acreage is PMR 45.

SOILS: Well-drained soils are preferred. Sandy or silt loams are sometimes selected for the earliest crop.

IRRIGATION: Sprinkler irrigation may be used to germinate the crop at an expense of \$87.50/acre. After planting, the beds are subbed past the seed line. Fall crops may be sprinkler irrigated. The last irrigation is scheduled about one week prior to harvest. During this time, excessive moisture may increase ground spotting, rotted and soft fruit.

FERTILIZER: Two hundred pounds of 11-48-0 may be applied before listing (if needed). Sixty pounds of nitrogen are sidedressed in one application. Fall melons tend to grow larger than the spring planted crop. Size is controlled by spacing, nitrogen fertility and irrigation practice. Some growers apply the preplant fertilizer as liquid ammonium phosphate injected next to the seedlines.

POLLINATION: One bee hive per acre is required. Some growers use 1½ hives per acre. The bees should be distributed on at least two sides of a 40 acre field.

PESTS AND DISEASES: Fall cantaloupes are subject to fewer pest problems than spring melons. Nematodes, cutworms, aphids, mites, loopers, leafhoppers, leafminers, ground beetles, crickets, mosaic virus and mildew may be problems. Consult your farm advisor for pest control information.

HARVESTING: Fall cantaloupes are hand harvested in October and November. The fruit are picked at the full slip stage. After hauling to a shed, they are sorted and graded in wood crates holding 23, 27, 36, 45 or 54 melons. Cartons may be used instead of the standard wood crate. Cartons hold 9, 12, 18 or 23 melons. The crates are hydrocooled or forced-air cooled prior to shipment.

SPECIAL PRACTICES: Root knot nematodes can cause serious damage to melons if not controlled by soil fumigation. The normal charges for fumigation are \$4.50 for application and \$30.00 for material.

SPRING CANTALOUPE--PROJECTED PRODUCTION COSTS--1979

Mechanical operations at custom rates. Hand labor at \$4.75 per hour (\$3.70 plus Social Security, unemployment insurance, transportation, supervision and fringe benefits).

Yield--175 crates per acre (7.5 tons). 120 days to maturity.

OPERATION	Custom Rate	MATERIALS		HAND LABOR*		SAMPLE COSTS Per Acre
		Type	Cost	Hours	Dollars	
LAND PREPARATION						
Subsoil	16.50					\$ 16.50
Disc 2x	5.50					11.00
Border, cross check & break borders	9.00					9.00
Flood		Water 3/4 ac ft	3.75	1	4.75*	8.50
Fertilize	3.25	400# 11-48-0	36.00			39.25
List and rerun beds	14.00					14.00
TOTAL LAND PREPARATION						\$ 98.25
GROWING PERIOD						
Plant & shape beds	9.00	Seed 2# @ 5.35/#	10.70			\$ 19.70
Encap mulch	4.50		36.00			40.50
Reshape beds	12.00					12.00
Pollination		Hives 1 1/2 @ 11.00	16.50			16.50
Thin				6	28.50	28.50
Cultivate 2x	10.00					20.00
Fertilize & furrow out 1x	5.00	100# N @ 25¢	25.00			30.00
Weed 1x				5	23.75	23.75
Irrigate 5x		Water 3 3/4 ac ft	18.75	8	38.00*	56.75
Pest Control 5x	3.50	Pesticides, Fungicides	40.00			57.50
TOTAL GROWING PERIOD						\$ 305.20
GROWING PERIOD & LAND PREPARATION COSTS						\$ 403.45
Land Rent (new lease)						150.00
Cash Overhead--10% of preharvest costs & land rent						55.34
TOTAL PREHARVEST COSTS						\$ 608.79
HARVEST						
Pick, haul, pack & crate 175 crates @ 5.50						\$ 962.50
TOTAL ALL COSTS						\$1571.29

Cost per crate = \$8.97 @ 175 crates/Ac
Cost per crate = \$8.54 @ 200 crates/Ac

* Includes shovel labor, pipe setting and miscellaneous tractor work.

SPRING CANTALOUPE CULTURE

1979

<u>YEAR</u>	<u>ACRES</u>	<u>YIELD/ACRE</u> <u>(TONS)</u>	<u>VALUE/TON</u>
1973	9500	6.95	\$189.45
1974	8300	7.53	221.95
1975	7400	5.32	280.94
1976	8850	6.37	249.48
1977	9440	6.56	214.87

PLANTING DATES: Open grown melons are planted from mid-January through mid-March. Harvesting begins in June and continues to early July.

VARIETIES: Nearly all of the acreage is planted to Topmark. PMR 45's are grown on small acreages in the Fall. New hybrid varieties are currently being evaluated.

SOILS: Well-drained soils are preferred. Sandy or silt loams are sometimes selected for the earliest crop. Heavier soils are preferred for most of the acreage because of their greater water holding capacity which slows the onset of vine collapse.

IRRIGATION: After planting, the beds are subbed past the seedline. Following emergence, water is often withheld for several weeks. This is done to maintain soil warmth and promote early production. The last irrigation is scheduled one week prior to harvest. During this time, excessive moisture may increase ground spotting, rotted and soft fruit.

FERTILIZERS: 400 pounds of 11-48-0 are often applied before listing. Up to 150 pounds of nitrogen are later sidedressed.

POLLINATION: At least on hive of bees per acre is recommended and 1½ hives are better. The bees should be distributed on at least two sides of a 40 acre field. Recent studies have indicated that yields are increased with heavy bee saturation.

PESTS AND DISEASES: Cantaloupes are subject to a number of problems including nematode, cutworms, aphids, mites, loopers, leafhoppers, leafminers, ground beetles, crickets, mosaic virus and mildew. Consult your farm advisor for pest control information.

HARVESTING: Spring melons are harvested from May to July. The fruit are hand picked at the full slip stage. After hauling to a shed, they are sorted and graded in wood crates holding 23, 27, 36, 45 or 54 melons. Cartons may be used instead of the standard wooden crates packing 9, 12, 18 or 23 melons. The melons are hydrocooled or forced-air cooled prior to shipment. Some harvesting is done with belt loading machines and mechanical pickup devices.

SPECIAL PRACTICES: Root knot nematodes can cause serious damage to melons if not controlled by soil fumigation. The normal charges for fumigation are \$4.50 for application and \$30.00 for fumigant. Soil samples may be taken to help detect these soil microorganisms.

CARROTS--PROJECTED PRODUCTION COSTS--1979

Mechanical operations at custom rates. Hand labor at \$4.75 per hour (\$3.70 plus Social Security, unemployment insurance, and transportation, supervision and fringe benefits).

Yield--550 54-lb. sacks per acre. (14.9 tons). 75-80 days to maturity.

OPERATION	Custom	MATERIALS		HAND LABOR*		SAMPLE COSTS
	Rate	Type	Cost	Hours	Dollars	Per Acre
LAND PREPARATION						
Subsoil	16.50					\$ 16.50
Disc 2x	5.50					11.00
Border, cross check & break borders	9.00					9.00
Flood		Water $\frac{3}{4}$ ac ft	3.75	1	4.75*	8.50
Fertilize	3.25	400# 11-48-0	36.00			39.25
Disc 2x	5.50					11.00
Triplane 2x	5.75					11.50
Fumigation	4.50	Fumigant	30.00			34.50
List	6.50					6.50
TOTAL LAND PREPARATION						\$ 147.75
GROWING PERIOD						
Plant	5.50	Seed 2# @ 5.00	10.00			\$ 15.50
Sprinkler Irrigate		Rent	40.00	10	47.50	87.50
Weed Control	3.50	Herbicides-Lorox® carrot oil**	7.00 41.00			51.50
Cultivate 2x	6.50					13.00
Spike 2x	4.75					9.50
Fertilize & furrow out 2x	6.00	150# N @ 25¢	37.50			49.50
Irrigate 7x		Water $5\frac{3}{4}$ ac ft	28.75	9	42.75*	71.50
Pest Control 2x	3.50	Insecticides	15.00			22.00
GROWING PERIOD						\$ 320.00
GROWING PERIOD & LAND PREPARATION COSTS						\$ 467.75
Land Rent (new lease)						150.00
Cash Overhead--10% of preharvest costs & land rent						61.77
TOTAL PREHARVEST COSTS						\$ 679.52
HARVEST COSTS*						
Harvest by machine, haul, pack, sell in sacks containing forty-eight 1 1/8 lb. cello bags, contract rate at 3.75/sack						\$2062.50
TOTAL ALL COSTS						\$2742.02

Cost per 54-lb. sack = \$4.98 @ 550 sacks/Ac
Cost per 54-lb. sack = \$4.79 @ 650 sacks/Ac

* Includes shovel labor, pipe setting and miscellaneous tractor work.

** Includes application.

CARROT CULTURE

1979

<u>YEAR</u>	<u>ACRES</u>	<u>YIELD/ACRE</u> <u>(TONS)</u>	<u>VALUE/TON</u>
1973	4500	14.64	\$107.62
1974	5900	18.86	93.77
1975	5200	17.21	152.29
1976	5150	20.10	45.71
1977	4300	16.77	190.62

PLANTING DATES: Early carrots are planted the last week in August and early September. Later maturing carrots are planted in October and early November. Carrot beds are normally planted with six rows of carrots on 42" beds. Three rows are placed on each bed shoulder. Rows are usually 1½" apart. The standard practice is to plant noncoated seed with a Planet Jr. but coated seed is becoming more common.

VARIETIES: Long Imperator 58 is the main variety grown. Danvers 126 is planted for cannery use. Some hybrid varieties are also being used.

SOILS: Carrots can be grown on many of the soil types in the County. Best root development is obtained in the lighter soils. Carrots should not be grown on stratified soils. If soils are too heavy deformed roots will result. Roots will not develop good color if the soil stays too wet. If the field contains appreciable trash, it may be necessary to stubble disc at \$12.00 per acre.

IRRIGATION: Carrots are sprinkler irrigated for stand establishment. Carrots germinate slowly, therefore, the beds must be kept moist to prevent crusting. Sprinklers also reduce the salinity in the seed beds and less salt will be present to be concentrated in the beds when converting to furrow irrigation. Sprinkler irrigation costs include rent, in-and-out labor, maintenance and sprinkler operation.

FERTILIZERS: Previous crop history will help in determining fertilizer requirements. Phosphate applied before listing at rates of 150 - 200 pounds P₂O₅ per acre. Two hundred pounds of nitrogen are usually ample. Preplant fertilizer should be disced into the soil before listing to prevent forking.

WEED CONTROL: From 50 - 100 gallons of carrot oil may be applied after the crop has 2 true leaves and before roots are ¼ inch in diameter. A residual herbicide can be applied when carrots are ¾ inches high. Consult your weed control farm advisor for additional information.

PESTS AND DISEASES: Crickets, grasshoppers, and cutworms can be a problem when seedlings emerge. Later, aphids and spider mites may attack the leaves. Cutworms and aphids may attack crowns.

Nematodes can be controlled by fumigation and damping-off by seed treatment. Root rot is usually absent under good cultural practices.

HARVESTING: Both hand and machine harvesting are practiced. Harvesting takes place from December to June. Carrots are shipped with tops, in cello paks or topped loose.

LETTUCE--PROJECTED PRODUCTION COSTS--1979

Mechanical operations at custom rates. Hand labor at \$4.75 per hour (\$3.70 plus Social Security, unemployment insurance, transportation, supervision and fringe benefits).

Yield--500 cartons per acre (13.75 tons). 90-110 days to maturity.

OPERATION	Custom Rate	MATERIALS		HAND LABOR*		SAMPLE COSTS Per Acre
		Type	Cost	Hours	Dollars	
LAND PREPARATION						
Subsoil	16.50					\$ 16.50
Disc 2x	5.50					11.00
Border, cross check & break borders	9.00					9.00
Flood		Water $\frac{3}{4}$ ac ft	3.75	1	4.75*	8.50
Fertilize	3.25	400# 11-48-0	36.00			39.25
Disc 2x	5.50					11.00
Triplane 2x	5.75					11.50
List	6.50					6.50
TOTAL LAND PREPARATION						\$ 113.25
GROWING PERIOD						
Incorporated beds	8.00	Herbicide Balan [®]	5.40			\$ 13.40
Sprinkler Irrigate		Rent	40.00	10	47.50	87.50
Plant (Precision)	8.50	Seed 1/4# & coating	25.00			33.50
Thin				13	61.75	61.75
Cultivate 3x	6.50					19.50
Fertilize & furrow out 2x	6.00	180# N @ 25¢	45.00			57.00
Weed				7	33.25	33.25
Irrigate 6x		Water 3 1/2 ac ft	17.50	7	33.25*	50.75
Insect Control 9x	3.50	Insecticides	120.00			151.50
GROWING PERIOD						\$ 508.15
GROWING PERIOD & LAND PREPARATION COSTS						\$ 621.40
Land Rent (new lease)						150.00
Cash Overhead--10% of preharvest costs & land rent						77.14
TOTAL PREHARVEST COSTS						\$ 848.54
HARVEST COSTS						
Custom harvest: cut, pack, haul 500 cartons @ 2.00/ctn						\$1000.00
TOTAL ALL COSTS						\$1848.54

Cost per carton = \$3.69 @ 500 ctn/Ac
Cost per carton = \$3.21 @ 700 ctn/Ac

* Includes shovel work, pipe setting and miscellaneous tractor work.

LETTUCE CULTURE

1979

<u>YEAR</u>	<u>ACRES</u>	<u>YIELD/ACRE</u> <u>(TONS)</u>	<u>VALUE/TON</u>
1973	42000	13.40	\$130.02
1974	49000	11.64	88.40
1975	45000	13.42	124.47
1976	43900	13.35	118.37
1977	41170	13.96	133.10

PLANTING DATES: Plantings extend continually from early September to mid-November. Early plantings are harvested in late November to early December while October and noncoated seed is used. Coated seed stands require less hand thinning. Seeds are planted 2-3 inches apart in row.

VARIETIES: The date of planting affects the variety grown since the season progresses from extreme heat to cool days and freezing nights, then back to moderately high temperatures in early Spring. Varieties commonly planted are: Empire, Merit (3186), K60, Winterhaven, Moranguard, RC 74, Morangold, Vanguard 75 and Vanguard. Early plantings mature in about 90 days while later ones require 120 or more days.

SOILS: Silt loams and sandy soils are preferred. The lighter soils provide better drainage during cold weather and warm up more readily. Lettuce has a moderate degree of salt tolerance. Excess salinity results in poor seed germination and small heads. Stubble discing at \$12.00/acre may be necessary to decompose.

IRRIGATION: Most growers use sprinklers until the seedlings emerge to provide better stands with reduced seeding rates. Gated pipe is also used especially near harvest. The irrigation labor costs used also include shovel work, grader work and pipe setting.

FERTILIZERS: 400 lbs. of 0-45-0 are broadcast prior to listing. Nitrogen is sidedressed just after thinning and during later growth. Early, warm-season lettuce requires less N than that grown in January and February. About 150 lbs. N is used early while 200 - 250 lbs. are applied to the cold weather crop. Lettuce should not be fertilized from December 25 to January 15 as it is normally too cold for efficient economic nitrogen use by the crop.

WEED CONTROL: Herbicides are applied preplant. Some types are sprayed over the beds postplant while others are incorporated with a ground or power driven incorporator. Consult the weed control farm advisor for latest information.

PEST AND DISEASES: Watch for crickets, cutworms, salt marsh caterpillars, beet armyworms, and cabbage loopers. Loopers can be especially serious after thinning. The most serious diseases are big vein, damping-off diseases, and sclerotinia. Use mosaic-free seed 0:30000. Consult the Farm Advisor's office for pest control recommendations. Outbreaks of disease such as downy mildew could require an additional \$30.00 for control.

FUMIGATION: Fumigation is needed on early fields where root knot and Longidorus nematodes are found. After soil temperatures cool down, Longidorus nematodes are less active. Root knot should be controlled anytime. Normal fumigation costs is \$34.50.

HARVESTING: Most lettuce is field packed in cartons, trucked to vacuum coolers, and shipped to market in refrigerated trucks and railway cars. Field packing of film-wrapped heads is also common.

FRESH ONIONS MARKET--PROJECTED PRODUCTION COSTS--1979

Mechanical operations at custom rates. Hand labor at \$4.75 per hour (\$3.70 plus Social Security, unemployment insurance, transportation, supervision and fringe benefits).

Yield--600 50# sacks per acre. (15 tons). 150+ days to maturity.

OPERATION	Custom Rate	MATERIALS		HAND LABOR*		SAMPLE COSTS Per Acre
		Type	Cost	Hours	Dollars	
LAND PREPARATION						
Subsoil	16.50					\$ 16.50
Disc 2x	5.50					11.00
Border, cross check & break borders	9.00					9.00
Flood		Water 3/4 ft/Ac	3.75	1	4.75*	8.50
Fertilize	3.25	400# 11-48-0	36.00			39.25
Disc 2x	5.50					11.00
Triplane 2x	5.75					11.50
List	6.50					6.50
TOTAL LAND PREPARATION						\$ 113.25
GROWING PERIOD						
Precision plant	8.50	Seed 2# coated	50.00			\$ 58.50
Herbicide 3x	3.00	Dacthal®	24.00			
		Sulfuric acid	18.00			51.00
Sprinkler Irrigate		Rent	40.00	10	47.50	87.50
Cultivate 3x	6.50					19.50
Fertilize & furrow out 2x	6.00	200# N @ 25¢	50.00			62.00
Weed 1x				9	42.75	42.75
Irrigate 12x		Water 4 1/2 ac ft	22.50	13	61.75*	84.25
Pest Control 8x	3.50	Pesticides	55.00			83.00
GROWING PERIOD						\$ 488.50
GROWING PERIOD & LAND PREPARATION COSTS						\$ 601.75
Land Rent (new lease)						150.00
Cash Overhead--10% of preharvest costs & land rent						75.17
TOTAL PREHARVEST COSTS						\$ 826.92
HARVEST COSTS						
Dig, top, haul, grade, sack selling commission for 600 sacks at 2.75 per 50-lb. sack						\$1650.00
TOTAL ALL COSTS						\$2476.92

Cost per sack = \$4.12 @ 600 sacks/Ac
Cost per sack = \$3.78 @ 800 sacks/Ac

* Includes shovel work, pipe setting and miscellaneous tractor work.

<u>YEAR</u>	<u>ACRES</u>	<u>YIELD/ACRE (TONS)</u>	<u>VALUE/TON</u>
1973	1500	17.33	\$ 242.46
1974	1700	12.50	105.79
1975	1500	15.33	196.57
1976	1790	10.45	94.81
1977	1860	13.30	189.10

PLANTING: Most acreage is direct seeded from mid-October to mid-November. Forty-two inch beds with 4 to 6 lines are used. Some plantings have been made with three lines on narrow beds. Stubble discing at \$12.00/A may be used to chop coarse stalks and refuse for decomposition.

VARIETIES: Onions are sensitive to day length and temperature. Only the early maturing, short day types are grown. The most popular types are Yellow Granex, Texas Early Grano 502, White Granex, Early Preminum and Dessex. Seed costs may vary from \$12.00 - \$30.00 per pound (or higher) depending upon variety and season. Grano types are often used for onion rings. Texas Grano and other ringer types are produced for the fried onion ring market.

WEED CONTROL: Herbicides are commonly applied pre-emergence. Consult your farm advisor for latest recommendations. Some postplant applications are made with corresponding additional costs.

SOILS: Medium-textured sandy loams are the most desirable. Onions are shallow rooted and need a friable soil which retains moisture especially after cultivation. Onions should never be stressed for water once the bulbs start to enlarge or splitting may result. Avoid salty, hard, or weed-infested soils.

IRRIGATION: Until two or three weeks before intended harvest, onions should never suffer for lack of water. Stressing onions for water before maturity may cause splitting. Weather and soil conditions determine the number of irrigations (usually 7-12x). Irrigation costs include shovel work, pipe setting and motor grading.

FERTILIZER: Generally, between 200 and 250 lbs. of actual nitrogen per acre and 144 and 200 lbs. of P₂O₅ are applied. All P₂O₅ and 33 to 50 lbs. of nitrogen are usually broadcast before listing followed by two sidedressings of nitrogen.

PESTS AND DISEASES: Mites, thrips, armyworms, leafminers, maggots, downy mildew and nematodes may be problems. Pink root is a soil-borne disease affecting onions; resistant varieties are available.

HARVESTING: Harvesting takes place from late March through May after 25% of the tops have fallen over. Bulbs are dug, hand topped and sacked in burlap for 3-5 days to cure. The sacks are then dumped into bulk trucks and hauled to sheds for grading, re-sacking, loading and shipping. Some growers partially cure onions on ventilated docks prior to shipment.

DEHYDRATOR ONIONS--PROJECTED PRODUCTION COSTS--1979

Mechanical operations at custom rates. Hand labor at \$4.75 per hour (\$3.70 plus Social Security, unemployment insurance, transportation, supervision and fringe benefits).

Yield--15 tons. 150+ days to maturity.

OPERATION	Custom Rate	MATERIALS		HAND LABOR*		SAMPLE COSTS Per Acre
		Type	Cost	Hours	Dollars	
LAND PREPARATION						
Subsoil	16.50					\$ 16.50
Disc 2x	5.50					11.00
Border, cross check & break borders	9.00					9.00
Flood		Water $\frac{3}{4}$ ft/Ac	3.75	1	4.75*	8.50
Fertilize	3.25	400# 11-48-0	36.00			39.25
Disc 2x	5.50					11.00
Triplane 2x	5.75					11.50
List	6.50					6.50
TOTAL LAND PREPARATION						\$ 113.25
GROWING PERIOD						
Precision plant	8.50	Seed 2#				\$ 8.50
Herbicide 2x	3.00	Dacthal® and Sulfuric acid	42.00			48.00
Sprinkler Irrigate		Rent	40.00	10	47.50	87.50
Cultivate 3x	6.50					19.50
Fertilize & furrow out 2x	6.00	250# N @ 25¢	62.50			74.50
Weed 1x				9	42.75	42.75
Irrigate 12x		Water 4 1/2 ac ft	22.50	13	61.75*	84.25
Pest Control 8x	3.50	Pesticides	55.00			83.00
GROWING PERIOD						\$ 448.00
GROWING PERIOD & LAND PREPARATION COSTS						\$ 561.25
Land Rent						150.00
Cash Overhead--10% of preharvest costs & land rent						71.12
TOTAL PREHARVEST COSTS						\$ 782.37

HARVEST COST: None--Production contract to pay \$62.00/ton return to grower.

Cost per ton = \$52.16 @ 15 tons/Ac

* Includes shovel labor, pipe setting and miscellaneous tractor work.

DEHYDRATOR ONION CULTURAL PRACTICES

1979

<u>YEAR</u>	<u>ACRES</u>	<u>YIELD/ACRE</u>	<u>VALUE/TON</u>
1973	1680	13.10	\$33.64
1974	3000	12.00	45.72
1975	3200	15.00	55.17
1976	925	16.20	52.00
1977	1760	11.13	54.91

PLANTING DATE: Contracting companies recommend the planting date to the grower and supply him with the seed. Planting dates may differ with variety but normally dehydrator onions will be planted between October 25 - November 20.

VARIETIES: Most dehydrator onions are white creole derivatives selected for a high soluble solids content. The seed is supplied by the dehydrator.

SOIL: Onions require soils with a low salt content. Sandy or medium textured soils are the best adapted.

IRRIGATION: Until two or three weeks before intended harvest, onions should never suffer from lack of water. Weather and soil conditions determine the number of irrigations. Irrigation costs listed include the use of sprinklers for germination. Also included are costs for shovel work, pipe setting and grading.

FERTILIZERS: Generally, between 200 and 250 lbs, of actual nitrogen per acre and 144 and 200 lbs. of P_2O_5 are applied. All P_2O_5 and 33 to 50 lbs. of nitrogen are usually broadcast before listing followed by two sidedressings of nitrogen.

PESTS AND DISEASES: Mites, thrips, armyworms, leafminers, maggots, downy mildew and nematodes may be problems. Pink root is a soil-borne disease affecting onions.

HARVESTING: The onions are machine topped, undercut and covered with a fine layer of soil to cure before harvesting. The onions are then machine dug and lifted to a sorter to remove clods and excess debris before loading on a truck and trailer for shipment to the dehydrator plant. All harvesting costs are paid by contractor.

OPEN GROWN SUMMER SQUASH--PROJECTED PRODUCTION COSTS--1979

Mechanical operations at custom rates. Hand labor at \$4.75 per hour (\$3.70 plus Social Security, unemployment insurance, transportation, supervision and fringe benefits).

Yield--500 18-lb. cartons/acre (4.5 tons). ± 70 days to maturity.

OPERATION	Custom Rate	MATERIALS		HAND LABOR		SAMPLE COSTS Per Acre
		Type	Cost	Hours	Dollars	
LAND PREPARATION						
Subsoil	16.50					\$ 16.50
Disc 2x	5.50					11.00
Border, cross check & break borders	9.00					9.00
Flood		Water 3/4 ac ft	3.75	1	4.75	8.50
Fertilize	3.25	400# 11-48-0	36.00			39.25
Disc 2x	5.50					11.00
List, flat beds	6.50					6.50
TOTAL LAND PREPARATION						\$ 101.75
GROWING PERIOD						
Plant & shape beds	7.00	Hybrid seed 2 lbs. @ 14.00/lb	28.00			\$ 35.00
Pollination		Hives 1 1/2 @ 11.00	16.50			16.50
Thin				8	38.00	38.00
Cultivate 2x	6.50					13.00
Fertilize & furrow out 1x	6.00	100# N @ 25¢	25.00			31.00
Weed 1x				6	28.50	28.50
Irrigate 10x		Water 4 ac ft	20.00	9	42.75	62.75
Pest Control 4x	3.50	Pesticides, Fungicides	30.00			44.00
TOTAL GROWING PERIOD						\$ 268.75
GROWING PERIOD & LAND PREPARATION COSTS						\$ 370.50
Land Rent						150.00
Cash Overhead--10% of preharvest costs & land rent						52.05
TOTAL PREHARVEST COSTS						\$ 572.55
HARVEST						
Pick, haul, grade, pack and sell 500 cartons @ 2.75						\$1375.00
TOTAL ALL COSTS						\$1947.55

Cost per carton = \$3.89 @ 500 ctn/Ac
Cost per carton = \$3.70 @ 600 ctn/Ac

Brushed Spring Squash

Normal costs per acre (initial investment): \$130.00 for paper, \$50.00 per acre for stakes, \$75.00 for new wire, \$100.00 for brush, \$120.00 for installation and \$100.00 for cleanup labor.

SUMMER SQUASH CULTURE

1979

<u>YEAR</u>	<u>ACRES</u>	<u>YIELD/ACRE (TONS)</u>	<u>VALUE/TON</u>
1973	940	3.51	\$ 226.99
1974	740	4.59	352.35
1975	800	4.25	340.29
1976	1070	11.64*	281.44
1977	580	6.31	246.53

PLANTING DATES: Fall plantings are seeded in late August and September. Spring plantings are made in late December and January for brushed plantings. Open grown spring squash is planted in January.

VARIETIES: Dark green zucchini is the predominant type produced. Open pollinated squash seed sells for \$6.00/lb. Hybrid seed sells for \$9-20.00 per lb. Planting rates vary from 1½ lbs. seed/acre for hand planting with hill drops on 60' beds to 7 lbs. for the double row 80" machine planted fall crop. Scallop (summer) and yellow crookneck are also grown.

SOIL: Squash is produced on a wide variety of soils depending upon location. The earliest production usually occurs in warmer areas where sandy or gravelly soils predominated. Salinity may be a problem in shallow soils.

IRRIGATION: After planting, the beds are subbed past the seedline. Following emergence, irrigation may be used sparingly until flowering to maintain soil warmth and promote early production. Once fruit formation has started the beds are kept moist.

FERTILIZERS: 400 lbs. of 11-48-0 should be applied before listing the beds. Up to 150 pounds of nitrogen may be sidedressed. Growers vary in fertilizer practices. Water-run applications of nitrogen fertilizers are often used. Some growers apply animal manures to supplement their fertilizer programs. If manures are used, pre-irrigation should follow the application. Seeding then can be done in a mulch, or on any beds.

PEST AND DISEASES: The most serious problem on spring squash is mosaic virus. Both watermelon mosaic and cucumber mosaic have been isolated. There are currently no control measures for mosaic virus. Brushed squash has a lower incidence of virus than does open grown squash. Ultimately the development of resistant varieties will be necessary to control the problem. Powdery mildew may also be a problem. Insect pests include: leaf miner aphids, crickets, white fly, ground beetles, leafhoppers and cutworms. Insect control expenses vary with growers. The usual range is \$30-70 per acre.

HARVESTING: Squash is hand harvested. Zucchini fruits are selected when they are 8-10" in length. Fruits which grow too large are in lower demand and therefore sell at lower prices. The squash is hauled in picking boxes to local sheds where the fruits are graded to size and quality and then packed in 18 lbs. cartons. Normal grades include large, fancy, extra fancy and choice.

SPRING SQUASH: South sloped 5 or 7 foot beds are frequently used for spring squash plantings. Brown paper is used to form a wind barrier and heat trap. It is fixed upright on the beds with stakes, wire and arrow weed (brush).

* Includes all squash (summer, banana and mediterranean).

MATURE GREEN TOMATOES, BUSH GROWN--PROJECTED PRODUCTION COSTS--1979

Mechanical operations at custom rates. Hand labor at \$4.75 per hour (\$3.70 plus Social Security, unemployment insurance, transportation, supervision and fringe benefits).

Yield--10.0 tons or 667 30-lb. cartons. Growing period--130 days.

OPERATION	Custom Rate	MATERIALS		HAND LABOR*		SAMPLE COSTS Per Acre
		Type	Cost	Hour	Dollars	
LAND PREPARATION						
Subsoil	16.50					\$ 16.50
Disc 1x	12.50					12.50
Landplane 1x	6.75					6.75
Border, cross check & break border	9.00					9.00
Flood		Water 3/4 ac ft	3.75	2	9.50*	13.25
Fertilizer	4.50	400# 11/48/0	36.00			
	6.50	150# 0-45-0	11.70			58.70
Disc 2x	5.50					11.00
Float	5.00					5.00
List beds	13.00					13.00
TOTAL LAND PREPARATION						\$ 145.70
GROWING PERIOD						
Plant & shape beds	12.50	Seed 1 1/2#	35.00			\$ 47.50
Thin 2x				32	152.00	152.00
Cultivate 3x	6.50					19.50
Fertilize--side-dress 2x	8.50	250# N	70.00			87.00
Weed 2x				18	85.50	85.50
Layby herbicide	4.50	Herbicide	16.00			20.50
Irrigate 12x		Water 8 ac ft	40.00	14	66.50*	106.50
Insect Control 14x	4.00	Insecticides	119.00			175.00
GROWING PERIOD						\$ 693.50
GROWING PERIOD & LAND PREPARATION COSTS						\$ 839.20
Land Rent (new lease)						150.00
Cash Overhead--10% of preharvest costs & land rent						98.92
TOTAL PREHARVEST COSTS						\$1088.12
HARVEST						
Contract @ 3.40 per 30# box, including picking, hauling, cooling, packing & selling						\$2267.80
TOTAL ALL COSTS						\$3355.92

Cost per carton @ 10 tons = \$5.03 or \$335.59 per ton
Cost per carton @ 15 tons = \$4.49 or \$299.21 per ton

* Includes shovel labor, pipe setting, miscellaneous tractor work.

MATURE GREEN TOMATOES--BUSH GROWN

1979

<u>YEAR</u>	<u>ACRES</u>	<u>YIELD/ACRE (TONS)</u>	<u>VALUE/TON^{1/}</u>
1973	2,000	7.0	\$ 313.42
1974	3,000	12.93	191.88
1975	1,400	11.50	618.01
1976	1,766	10.87	415.83
1977	2,385	6.29	284.00

PLANTING DATES: Bush tomatoes are planted from early January through February 15 for an early June harvest. A small acreage may also be seeded in July or August for harvest in winter.

VARIETIES: Earlypak 7, Cal Ace, VFN Bush and Hybrid Sunlight are the principal varieties grown. However, other varieties resistant to Fusarium, Verticillium, and nematodes are planted on small acreages.

SOILS: Medium to heavy soils that are well drained are best. Such soils maintain their moisture content longer and more uniformly than sandy soils. Fields should be low in salinity.

IRRIGATION: Moisture should be maintained as uniformly as possible. Large fluctuations in soil moisture or water stress conditions can be detrimental to plant and fruit development.

FERTILIZERS: Before listing, 30-50 pounds nitrogen and 150-250 pounds phosphate are broadcast. Phosphate material may be also sidedressed into the bed on both sides of the row in addition to the broadcast application. Banding of reduced fertilizer rates under and on both sides of the seed row may be also practiced with no previous broadcast application. After thinning, 150-250 pounds of N are sidedressed and water run depending on the previous crop. Excess nitrogen results in delayed and uneven maturity.

PESTS AND DISEASES: The primary insect problems are tomato fruit worms, armyworms, tobacco budworms, thrips, aphids, pinworms, stink bugs, and cutworms. Curly top virus, fusarium wilt, and alfalfa mosaic are the chief diseases. Fumigation is required for root knot infested fields. If fumigation is required, add \$35.00 to costs.

HARVESTING: Most of the fruit is picked in the mature green stage, placed in field trailers or bins and hauled to shed for washing, cooling and packing.

WEED CONTROL: A pre-emergence and layby application may be applied. Consult your farm advisor in weed control for a list of registered and adapted materials.

^{1/} Includes stake tomatoes.

TOMATOES--PROCESSING--PROJECTED PRODUCTION COSTS--1979

Mechanical operations at custom rates. Hand labor at \$4.75 per hour (\$3.70 plus Social Security, unemployment insurance, transportation, supervision and fringe benefits).

Yield--25 tons. Growing period 140 days.

OPERATION	Custom Rate	MATERIALS		HAND LABOR*		SAMPLE COSTS Per Acre
		Type	Cost	Hours	Dollars	
LAND PREPARATION						
Disc 2x	5.50					\$ 11.00
Border, cross check & break borders	9.00					9.00
Flood		Water 3/4 ac ft	3.75	2	9.50*	13.25
Disc 2x	5.50					11.00
Float	5.00					5.00
List Beds	13.00					13.00
Rotovate--shape beds	13.00					13.00
Fertilizer (Brd)	4.50	300 lbs 11-48-0	27.00			31.50
Fertilizer	6.50	300 lbs 0-45-0	23.40			29.90
TOTAL LAND PREPARATION						\$ 136.65
GROWING PERIOD						
Plant--shape beds	12.50	Seed 1½ lbs	30.00			\$ 42.50
Preplant herbicide	4.50	Devrinol®	12.00			16.50
Sprinkler		Rent	40.00	10	47.50	87.50
Hand thin--weed				10	47.50	47.50
Cultivate 2x	6.50					13.00
Lilliston 2x	6.00					12.00
Fertilizer 2x	6.50	250 N	53.50			66.50
Hand weed 1x				5	23.75	23.75
Irrigation 10x		4½ ac ft	22.50	13	61.75*	84.25
Layby herbicide	4.50	Dacthal®	11.00			15.50
Pest Control 10x	4.00		75.00			115.00
GROWING PERIOD						\$ 524.00
GROWING PERIOD & LAND PREPARATION COSTS						\$ 660.65
Land Rent (new lease)						125.00
Cash Overhead--10% of preharvest costs & land rent						78.56
TOTAL PREHARVEST COSTS						\$ 864.21
HARVEST						
Custom harvest 25 tons @ 24.50						\$ 612.50
TOTAL ALL COSTS						\$1476.71

Cost per ton @ 25 T/ac = \$59.07
Cost per ton @ 35 T/ac = \$49.19

* Includes shovel labor, pipe setting, miscellaneous tractor work.

YIELDS-PRICES: Approximately 800 acres were harvested in 1978 and 1400 acres in 1977. Yields in both years have ranged from 20 to over 40 tons per acre. In 1977 local prices were \$62.50 per ton and in 1978, \$54.50.

PLANTING: Cannery tomatoes are planted and watered from January 15 to February 20. Seed is applied on double-row beds, listed and shaped 60 inch, center to center, with rows 12 inches apart on a 36-38 inch bed top. Both sprinklers and furrow irrigation are used for germination. Sprinklers are most common.

VARIETIES: During the past three-four years several varieties have performed well. The square round types are only used by the processor. The varieties UC82, Peto Mech II, UCL34, Hunts 2580, Hunts 2199, Peto 81, and Goldsmith #9 are the most widely used. New varieties are continually being developed and will no doubt replace the above varieties after they are widely tested under desert area conditions.

SOILS: Medium to heavy soils that are well drained are best. Such soils maintain moisture longer and more uniformly than sandy soils. Fields selected should be low in salinity.

FERTILIZER: Nitrogen and phosphorus may be either broadcast preplant or injected at or before planting. A combination of both methods also can be used. All of the phosphorus should be applied preplant or at planting. One hundred to 150 pounds P₂O₅ injected or sidedressed is generally adequate. A small amount of nitrogen, 20-30 pounds, can be applied at or before planting. The remaining 225 pounds nitrogen is divided up into three or four applications beginning at thinning. Generally, two sidedressing are adequate with one application in the irrigation water several weeks before harvest.

THINNING: All processor-type cultivars are bush type vines allowing high plant population per acre. Single plant spacing is not necessary. Clump thinning allowing two-three plants per hill spaced at 9 to 12 inch centers down the row has performed very well. The use of coated seed and space planting is possible, eliminating the need for thinning.

IRRIGATION: Moisture should be maintained as uniformly as possible throughout the season. Too much water during the early growth of the plant encourages shallow roots. Adequate moisture needs to be maintained later in the season during maximum fruit development.

PESTS AND DISEASES: Main insect pests are aphids, tobacco budworms, tomato fruit worms, armyworms, pin worms, thrips and stink bugs. Curly top virus and alfalfa mosaic is an occasional problem. Fumigation is required for root knot nematode infested fields. If fumigation is required, add \$35.00 to costs. For a list of registered and adapted chemicals for weeds, pests and disease control, consult your farm advisor.

HARVESTING: Local growers sign contracts with custom harvesters and truckers to harvest and haul to the processor. Harvesting is coordinated with the processor's plant capacity. Harvest normally begins near June 15 and continues until late July.

SPECIAL PRACTICES: Several companies market white reflective material for sunburn control--if used add from \$30.00-\$40.00 per acre to costs.

WATERMELONS--SAMPLE PRODUCTION COSTS--1979

Mechanical operations at custom rates. Hand labor at \$4.75 per hour (\$3.70 plus Social Security, unemployment insurance, transportation, supervision and fringe benefits).

Yield--10 tons per acre. 120 days to maturity.

OPERATION	Custom Rate	MATERIALS		HAND LABOR*		SAMPLE COSTS Per Acre
		Type	Cost	Hours	Dollars	
LAND PREPARATION						
Subsoil	16.50					\$ 16.50
Disc 2x	5.50					11.00
Border, cross check & break borders	9.00					9.00
Flood		Water 3/4 ac ft	3.75	1	4.75*	8.50
Fertilize	3.25	400# 11-48-0	36.00			39.25
Border disc & rerun	14.00					14.00
TOTAL LAND PREPARATION						\$ 98.25
GROWING PERIOD						
Plant & shape beds	9.50	Seed 2# @ 5.50	11.00			\$ 20.50
Pollination		1 1/2 hives @ 11.00	16.50			16.50
Thin				8	38.00	38.00
Cultivate 4x	6.50					26.00
Fertilize & furrow out 2x	6.50	200# N @ 25¢	50.00			63.00
Weed 2x				6	28.50	28.50
Irrigate 6x		Water 3 ac ft	15.00	7	33.25*	33.25
Pest Control 7x	3.50	Insecticides	70.00			94.50
GROWING PERIOD						\$ 320.25
GROWING PERIOD & LAND PREPARATION COSTS						\$ 418.50
Land Rent (new lease)						150.00
Cash Overhead--10% of preharvest costs & land rent						56.85
TOTAL PREHARVEST COSTS						\$ 625.35
HARVEST						
Pick, haul, selling commission, load 42.00 ton @ 10 tons/acre						\$ 420.00
TOTAL ALL COSTS						\$1045.35

Cost per ton = \$104.54 @ 10 tons/Ac

* Includes shovel work, pipe setting and tractor work.

<u>YEAR</u>	<u>ACRES</u>	<u>YIELD/ACRE (TONS)</u>	<u>VALUE/TON</u>
1973	4,000	7.25	\$ 101.21
1974	2,200	9.10	107.85
1975	2,600	7.73	144.83
1976	2,200	6.95	121.63
1977	2,300	8.75	89.39

PLANTING DATES: Plantings to be capped are seeded from mid-December to February. Open melons are planted from February through mid-March.

VARIETIES: Improved Peacock is the most popular variety. It has a dark green skin, brilliant red flesh and a tough rind, which makes it an excellent shipper. Calsweet is a new striped variety which is becoming more popular.

HOT CAPS: Early planted watermelons may be hot capped with small paper tents over a wood frame used to produce miniature "greenhouses". The plants receive increased heat and frost protection. Labor and materials for hot capping costs \$150.00 or more per acre.

SPECIAL CULTURAL PRACTICES: Vine turning helps to keep vines on the high sloped beds used for early production. Covering the melons with vines helps to prevent sunburn. Some growers spend as much as \$150.00 per acre on hand labor for these operations.

SOILS: Watermelons are best grown on non-saline, sandy loam or silt loam soils. Soil temperatures of 95 F are optimum for germination.

IRRIGATION: After planting, the first irrigation should run until the beds are completely subbed. Following emergence, water may be withheld until flowering.

FERTILIZERS: Four hundred pounds of 11-48-0 are often applied before listing. Up to 200 pounds of nitrogen are later sidedressed in split applications. Irrigation costs include shovel work, pipe setting and grading.

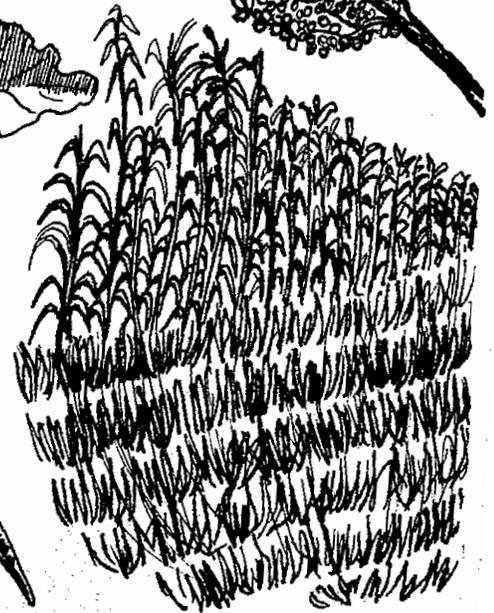
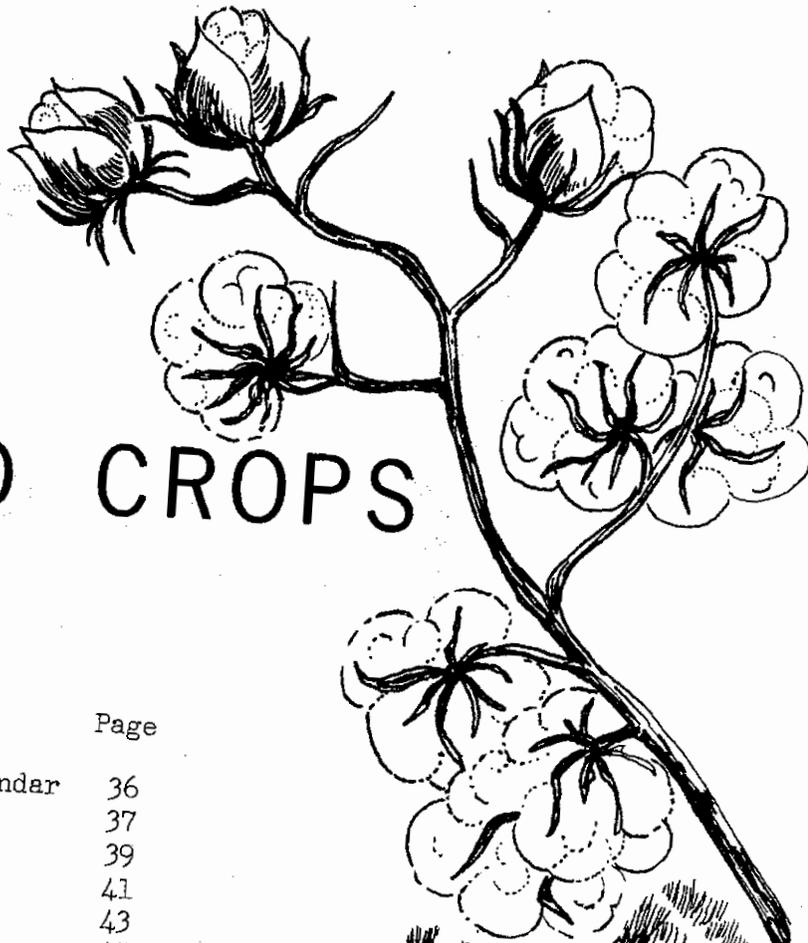
PESTS AND DISEASES: Cutworms, aphids, spider mites, darkling ground beetles, leafhoppers, cabbage loopers, and leafminers are the most serious pests of watermelon. Bacterial rind rot is the most serious disease. For latest information consult your farm advisor.

HARVESTING: A sharp knife is used to cut melons from the vines. Pulled melons may crack open. Melons are picked on the basis of color change, thumping, and rind roughness. Color change is the most reliable. Loss of natural protection on the fruit can increase sunburn. Exposed fruit are covered with vines during the harvest period to prevent sunburning each time the field is harvested. A field may be covered more than five times to protect the fruit. Most fields are picked twice and some a third time depending upon market value and the degree of sunburned fruit.

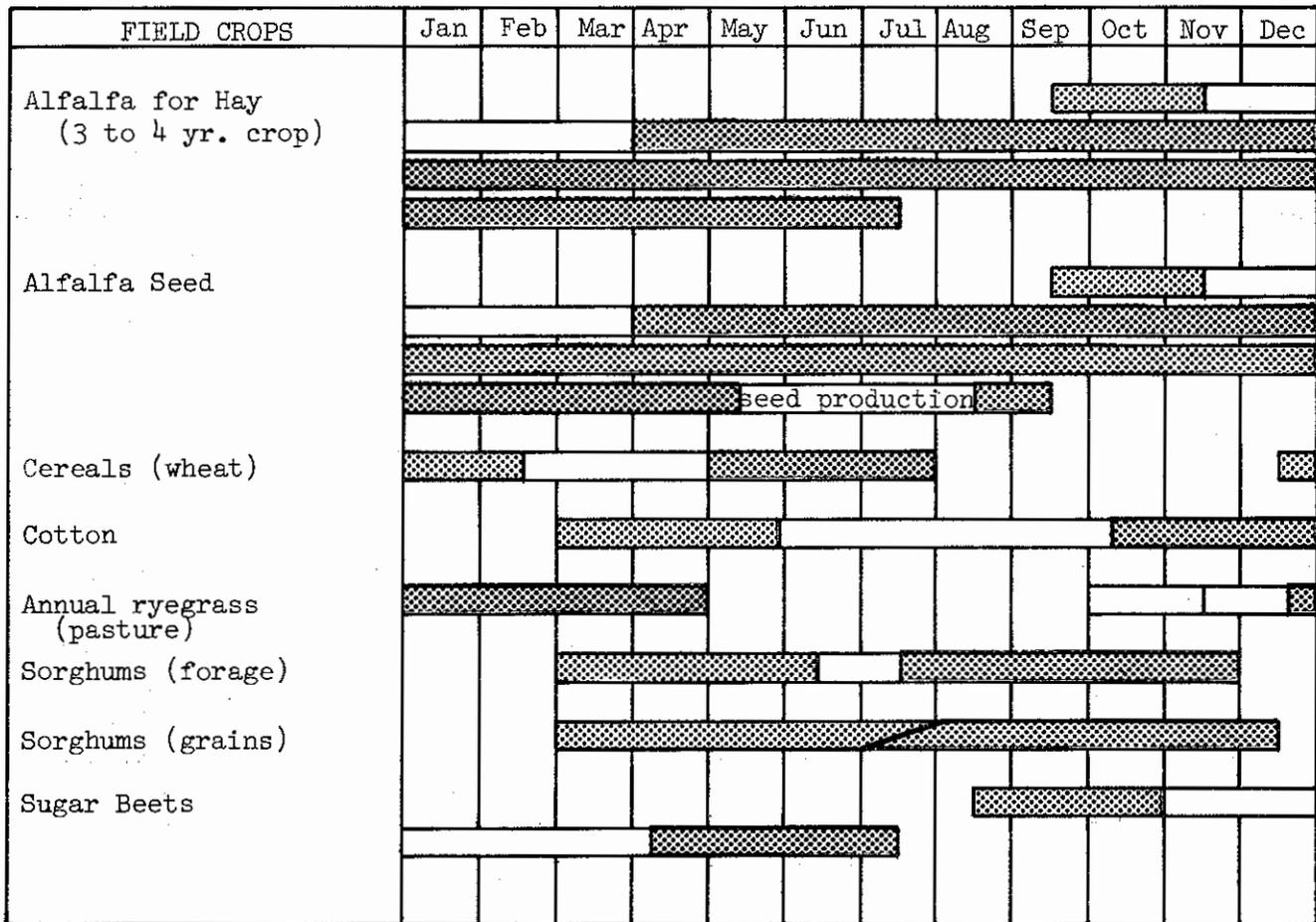
FIELD CROPS

Page

Planting Calendar	36
Alfalfa	37
Alfalfa Seed	39
Cereal Crops	41
Cotton	43
Ryegrass	45
Sorghums (Grain)	47
Sudangrass	49
Sugar Beets	51



SCHEDULE OF MAJOR CROPS - PLANTING AND HARVEST - IMPERIAL VALLEY



Planting  Cultivation, growth & lay-by  Harvest 

Seed Crops follow seasonal cropping.

Cattle feeding is a major operation throughout the year.

Lamb feeding - October through March.

ALFALFA--PROJECTED PRODUCTION COSTS--1979

Mechanical operations custom rates. Labor at \$4.50 per hour (\$3.70 plus Social Security, unemployment insurance and fringe benefits).

Yield--8.0 tons per acre.

OPERATION	Custom Rate	MATERIALS		HAND LABOR*		SAMPLE COSTS Per Acre
		Type	Cost	Hours	Dollars	
LAND PREPARATION						
Plow or subsoil	15.75					\$ 15.75
Disc 2x	5.50					11.00
Fertilize	3.75	11-48-0 (260#)	24.05			27.80
Build & break borders	9.00					9.00
Flood		3/4 ac ft	3.75	2	9.00*	12.75
Disc 2x	5.50					11.00
Landplane 2x	6.75					13.50
Border	9.00					9.00
Float	5.00					5.00
TOTAL LAND PREPARATION						\$ 114.80
COST OF ESTABLISHMENT						
Weed Control	5.50	Herbicide	6.50			\$ 12.00 ^{a/}
Planting ^{b/}	6.50	20# seed @ 1.75/lb.	35.00			41.50
Irrigate (2-3x)		1 ac ft	5.00	2	9.00*	14.00
Insect Control 1x	3.50	Insecticide	7.00			10.50
COST OF ESTABLISHMENT						\$ 78.00
TOTAL COST OF STAND ESTABLISHMENT						\$ 192.80
ANNUAL COSTS OF HAY PRODUCTION--3 YEAR LIFE						
Irrigate 16x		7 ac ft	35.00	9	40.50*	\$ 75.50
Fertilize	4.50	100# P ₂ O ₅	21.00			25.50
Insect Control 6x	3.50	Insecticides	30.00			51.00
TOTAL ANNUAL CULTURAL COSTS						\$ 152.00
Land Rent (new lease)						\$ 125.00
Depreciation--1/3 on total cost of stand establishment						64.27
Cash Overhead--10% of annual costs & land rent						27.70
TOTAL PREHARVEST COSTS						\$ 368.97
HARVEST COSTS						
Swather 7x	5.00					\$ 35.00
Rake 7x	2.50					17.50
Bale 8.0 tons	7.00/ton					56.00
Haul & stack	0.15/bale					19.20
TOTAL ALL COSTS						\$ 496.67

Cost per ton--6.0 tons = \$79.65
Cost per ton--8.0 tons = \$62.08
Cost per ton--10.0 tons = \$51.55

Some fields may be reseeded the second year due to loss of stand. The additional cost will average between \$20.00 and \$40.00 per acre depending upon the extent of stand loss.

^{a/} One application of post emergence herbicide--2,4-DB; a second application of IPC may be needed.

^{b/} Corrugation is \$2.25 extra.

* Includes shovel labor, pipe setting, miscellaneous tractor work.

GENERAL INFORMATION: The average yields, acreage and value for alfalfa hay during the past five years have ranged from 8.3 to 9.0 tons per acre, 109,000 to 153,000 acres and \$52.00 to \$69.33 per ton, respectively. There are also 15,000 to 25,000 acres of cubed hay annually.

SOIL PREPARATION: A uniform seed bed is a prerequisite to a good stand. High spots in the field cause an uneven germination, irrigation and poor stands. A well drained field is also necessary to lessen the likelihood of salinity, scald, and root rot problems.

PLANTING RATES: One pound of seed per acre will provide 4 to 5 seeds per square foot. At this rate, 15 pounds are equal to 60 to 75 seeds per square foot. Growers use 15 to 30 pounds seed depending on condition of their field, cost of seed, method of planting and time of planting.

PLANTING DATES: Late September through November is the preferred time for planting. Later plantings often result in poor germination. Spring plantings, if necessary, are suggested in February and March.

VARIETIES: Certified CUF 101, U.C. Salton and U.C. Cargo alfalfa are recommended because of their resistance to the spotted alfalfa aphid and superior yielding ability. A number of commercial varieties also have good spotted alfalfa aphid resistance and are very good yielders.

FERTILIZATION: Approximately 100 pounds of phosphate is taken from the soil by each 7-8 tons of alfalfa. This must be replaced to maintain maximum hay production. A preliminary application of at least 100-150 pounds of phosphate per acre is recommended prior to planting. On soil low in nitrogen 20 to 30 pounds of nitrogen stimulates seedling growth. A deficiency in nitrogen may occur on soils recently brought into production. Additional annual applications of 100 pounds of phosphate are recommended.

IRRIGATION: Two or three irrigations per cutting are necessary depending on the type of soil and time of year.

WEED CONTROL: Consult Weed Control Farm Advisor for most efficient weed control procedures.

PESTS AND DISEASES: Usually, the spotted alfalfa aphid causes damage on non-resistant alfalfa. Control is sometimes necessary for the Egyptian alfalfa weevil and sometimes for the pea aphid in February and March. The arrival of the blue aphid, *Acyrothosiphon sp.* to the Imperial Valley may require additional insecticidal costs on alfalfa hay. Alfalfa caterpillar and beet armyworm usually require control in mid to late summer. Occasionally cutworm outbreaks occur in fall and spring months. Root rot (*Rhizoctonia* and *Phytophthora*) also can be a severe problem. Consult farm advisor, Entomology, for registered and adapted materials.

HARVESTING: Alfalfa is normally baled from March until October. During winter months both pasturing and green chopping are practiced. Both pasturing and green chop may return from \$30.00 to \$60.00 per acre for the winter months.

ALFALFA SEED--PROJECTED PRODUCTION COSTS--1979

Mechanical operations at custom rates. Labor at \$4.50 per hour (\$3.70 plus Social Security, unemployment, and fringe benefits).

Typical yield of 300 pounds of clean seed in 90 days on an established alfalfa stand.

OPERATION	Custom Rate	MATERIALS Type	Cost	HAND LABOR*		SAMPLE COSTS Per Acre
				Hours	Dollars	
SEED PRODUCTION COSTS						
Irrigate 4x		Water 2 ac ft	10.00	2	9.00*	\$ 19.00
Insect Control 5x	3.50	Insecticides	40.00			57.50
Bees		3 colonies @ 11.00	33.00 ^{a/}			33.00
Defoliation	4.50		10.50			15.00
TOTAL PREHARVEST COSTS						\$ 124.50
Combining	25.00					\$ 25.00
Hauling	5.00/ton					.75
Cleaning seed	3.50/cwt ^{b/}					10.50
Bags			1.00/cwt			3.00
TOTAL HARVEST COSTS						\$ 39.25
PREHARVEST & HARVEST COSTS						\$ 163.75
Land Rent						140.00
Cash Overhead--10% of preharvest, harvest & land rent						30.38
TOTAL ALL COSTS						\$ 334.13

<u>Yield per acre</u>	<u>Cost per pound</u>
200	1.65
300	1.11
400	.85
500	.69
600	.58
700	.51

^{a/} Eleven dollars for the first 30 days and then \$0.50 per day per colony for each extra colony-day.

^{b/} Add \$2.00 for dodder cleaning and \$10.25 for lab test for germination and purity per lot.

* Includes shovel labor, pipe setting, miscellaneous tractor work.

GENERAL INFORMATION: The average yield, acreage and value for non-certified alfalfa seed during the last five years are given below.

<u>YEAR</u>	<u>ACRES</u>	<u>YIELD/ACRE</u> <u>(LBS)</u>	<u>VALUE/LB</u>
1973	8600	262	\$ 1.06
1974	15000	373	0.98
1975	8500	240	0.66
1976	4500	415	0.86
1977	4030	400	0.80

STARTING DATES: The best possibilities for a good seed crop occur when the last hay is out between May 1 and May 15. By June 1 to 15 the field is in full bloom. Seed crops made at this time of the year avoid lygus, stink bugs and alfalfa seed chalcid infestations which build up from early spring until late fall when the weather breaks. Late crops maturing in August and September may be damaged by rain.

Earlier seed crops may not bloom properly due to cold weather and seed "set" may be light or delayed.

VARIETIES: A number of non-dormant varieties are grown in Imperial County. Varieties that are resistant to the spotted alfalfa aphid, such as CUF 101, U.C. Salton, U.C. Cargo, El Unico and Mesa Siraa, are recommended.

IRRIGATION: Allow the plants to become slightly stressed for water up until the bloom period to prevent rank growth; after bloom begins, the plants should be irrigated no more frequently than necessary to prevent wilting and to help produce well-filled seed pods. The flowers of a slightly stressed plant contain higher concentrations of nectar and are more attractive to bees.

PESTS CONTROL: Early season lygus control is necessary and more important than later in the season. Stink bugs can cause damage to maturing seed and should be controlled. Consult Farm Advisors office for information on pests and their control.

POLLINATION: "Bees" are the only pollinators of any value on alfalfa. In Imperial County it is necessary to rely on honey bees because of a lack of sufficient solitary pollen collecting bees. Usually, at least three colonies of bees per acre are used in the higher yielding fields.

Five or more colonies are suggested on seed fields with both high plant and flower populations.

HARVESTING: Most seed alfalfa is defoliated using dinitro compounds applied by airplane at from 1 to 3 pints in 8 to 12 gallons of diesel oil per acre.

CEREAL CROPS--PROJECTED PRODUCTION COSTS--1979

Mechanical operations at custom rates. Labor at \$4.50 per hour (\$3.70 plus Social Security, unemployment insurance, and fringe benefits).

Yield--2.5 tons per acre. Days to maturity 90-170 days.

OPERATION	Custom Rate	MATERIALS		HAND LABOR*		SAMPLE COSTS Per Acre
		Type	Cost	Hours	Dollars	
LAND PREPARATION						
Disc 2x	5.50					\$ 11.00
Fertilize	4.50	190# N @ 12¢	22.80			27.30
Border & cross check	9.00					9.00
Float	5.00					5.00
TOTAL LAND PREPARATION						\$ 52.30
GROWING PERIOD						
Plant	6.50	Seed 90# @ 13¢	11.70			\$ 18.20
Irrigate 7x		3 ac ft	15.00	3.5	15.75*	30.75
Weed Control	3.50	Herbicides	2.00			5.50
Pest Control 1x	3.50	Insecticides	5.00			8.50
GROWING PERIOD						\$ 62.95
GROWING PERIOD & LAND PREPARATION COSTS						\$ 115.25
Land Rent (new lease)						100.00
Cash Overhead--10% of preharvest costs & land rent						21.53
TOTAL PREHARVEST COSTS						\$ 236.78
HARVEST COSTS						
Combine	(12.00 per ton acre & 30¢ cwt over 1 ton)					\$ 21.00
Hauling	\$3.50 per ton					8.75
TOTAL ALL COSTS						\$ 266.53

	CWT	PER TON
Cost per unit--2.5 tons =	\$5.33	or \$106.61
Cost per unit--3.0 tons =	\$4.52	or \$ 90.43

* Includes shovel labor, pipe setting, miscellaneous tractor work.

<u>WHEAT</u>				<u>BARLEY</u>			
Year	Acres	Yield/Acre (tons)	Value/Ton	Year	Acres	Yield/Acre (tons)	Value/Ton
1973	100,000	2.60	\$100.00	1973	18,000	1.75	\$ 80.00
1974	104,000	2.53	130.00	1974	5,600	2.14	120.00
1975	165,000	2.20	120.00	1975	3,800	2.60	110.00
1976	156,500	2.66	122.00	1976	3,800	2.38	121.60
1977	77,600	2.55	102.00	1977	7,000	2.55	90.00

LAND PREPARATION: When grains are planted in the mulch, the practice is disc, fertilize, disc and float. Next, apply the pre-mulch irrigation and when dry enough, mulch and plant.

PLANTING DATES, RATES AND DEPTH: Optimum planting dates for high grain yields of wheat are from December 1 through January 15. Rates of seeding average 90 pounds per acre. Seed should not be planted deeper than 3-4 inches if planted in the mulch. If the crop is to be irrigated up, shallow planting of 1/2-1 inch is best.

VARIETIES: Recommended varieties of wheat include the common wheats, Yecora Rojo and Probred, and durum wheats Produra, Modoc and Mexicali 75. All three durum varieties have a high percentage of shattering. Mexicali 75 and Produra do not have an exceptionally high percent of hard vitreous kernels.

Varieties of barley adapted are Numar and CM 67. CM 67 is tolerant to the yellow dwarf virus. There are other proprietary varieties such as GUS that are excellent yielders.

FERTILIZATION: Imperial Valley soils usually contain sufficient phosphorus for grain production if phosphates have been applied to other crops in the rotation. In a wheat-sorghum rotation, phosphates should be applied to the wheat. Wheat generally needs added nitrogen at rates of 100-180 pounds per acre, depending on the previous crop. For good yield and quality of varieties with a tendency towards yellowberry (low percent hard vitreous kernels), nitrogen should be applied at a rate of 180 or 240 (after sudangrass) pounds per acre split into three applications-- at preplant, tillering and boot stage or all as preplant.

IRRIGATION: Pre-mulch irrigations should be heavy. Subsequent irrigations should be sufficient to maintain good growth and avoid stress. Yield can increase with the last irrigation as late as the medium dough stage, but this late irrigation also increases the risk of shattering, lodging and regrowth.

WEED CONTROL: Weeds should be controlled in wheat to increase yield and to reduce the weed population in following crops. Consult the Farm Advisors' office for chemicals that are available for use.

INSECT CONTROL: Aphids are the only insects which consistently cause serious damage to wheat. Contact the Farm Advisors' office for insecticides that can be used in Imperial Valley.

COTTON--PROJECTED PRODUCTION COSTS--1979

Mechanical operations at custom rates. Labor at \$4.50 per hour (\$3.70 plus Social Security, unemployment, and fring benefits).

Yield--2.5 bales per acre. Days to harvest 170 to 200+ days.

OPERATION	Custom Rate	MATERIALS		HAND LABOR*		SAMPLE COSTS Per Acre
		Type	Cost	Hours	Dollars	
LAND PREPARATION						
Subsoil	16.50					\$ 16.50
Disc 2x	5.50					11.00
Fertilize	4.50	130# N @ 12¢	15.60			20.10
Float	5.00					5.00
List	6.50					6.50
Irrigate		Water .5 ac ft	2.50	2	9.00*	11.50
Cultivate	6.50					6.50
TOTAL LAND PREPARATION						\$ 77.10
GROWING PERIOD						
Plant	6.50	Seed 20# @ 40¢	8.00			\$ 14.50
Pre-plant herbicide	4.25	Herbicide	10.00			14.25
Cultivate 3x	6.50					19.50
Fertilize 2x	5.00	200# N @ 16¢	32.00			42.00
Insect Control 12x	3.50	Insecticide	100.00			142.00
Layby herbicide	4.25	Herbicide	15.00			19.25
Irrigate 10x		Water 6 ac ft	30.00	10	45.00*	75.00
Defoliate 2x	3.50		8.50			15.50
GROWING PERIOD						\$ 342.00
GROWING PERIOD & LAND PREPARATION COSTS						\$ 419.10
Land Rent (new lease)						125.00
Cash Overhead--10% of preharvest cost and land rent						54.41
TOTAL PREHARVEST COSTS						\$ 598.51
HARVEST COSTS						
Machine picking 45.00 per bale (\$3.00 cwt seed cotton first pick and \$3.00 cwt second pick with \$30.00/Ac minimum)						\$ 120.00
Hauling	4.00/bale					10.00
Ginning**	2.25/cwt of seed cotton					
TOTAL ALL COSTS						\$ 728.51

Cost per pound @ 2.5 bales = 58¢ Cost per pound @ 3.0 bales = 50¢
--

* Also includes additional shovel, grader work and tube setting.

**Ginning cost has usually been offset by seed sales.

<u>YEAR</u>	<u>ACRES</u>	<u>YIELD/ACRE</u> (in lbs)	<u>VALUE/LB</u>
1973	39,000	1142	0.65
1974	87,000	1191	0.50
1975	45,000	1036	0.55
1976	71,000	957	0.65
1977	143,000	604	0.60

LAND PREPARATION: Cotton usually is grown in raised beds 38 to 42 inches apart. The crop is generally planted in a semi-mulch and irrigated up.

Cotton can be grown on all soil types in Imperial County.

PLANTING DATES AND RATES: Cotton can be planted from March through April. Yields decrease when cotton is planted later than early April. A soil temperature of at least 60° F at a depth of 8 inches is desirable. Spacings within the row of 3 to 12 inches result in approximately the same yields.

VARIETIES: Delta Pine 61E, Delta Pine 66, Delta Pine 55, Stoneville 256, Stoneville 213, and Stoneville 731N have been successfully grown.

FERTILIZATION: About 250 pounds of nitrogen per acre will produce a good crop on solid planted cotton. The applications should be made before planting, at thinning, and in June and July. Although tests have shown no yield increases due to phosphate application, it is a common practice.

IRRIGATION: Do not allow the plants to remain wilted for extended periods of time. The number of irrigations depends upon the season and the desired end--a top crop (maximum number of irrigations) or a short season crop (fewer irrigations).

WEED CONTROL: Several herbicides are now in common use both as preemergence and layby treatments. Consult Farm Advisors' office for registered adapted chemicals.

INSECT CONTROL: The pink bollworm, the cotton leaf perforator, tobacco budworm, and cotton bollworm are widespread and pose a serious threat to cotton production. The presence of these insect pests results in increased costs for pest control since multiple applications are necessary to keep them in check. The insecticide costs included in this circular could be higher depending upon the presence of these and other pests. Consult Farm Advisor's office for latest information.

DISEASE CONTROL: Seedling diseases can reduce cotton stands to the point where replanting may be necessary. The seedling disease problem frequently is more severe where cotton follows sugar beets or alfalfa.

ANNUAL RYEGRASS PASTURE--PROJECTED PRODUCTION COSTS--1979

Mechanical operations at custom rates. Labor at \$4.50 per hour (\$3.70 plus Social Security, unemployment insurance, and fringe benefits).

OPERATION	Custom Rate	MATERIALS		HAND LABOR		SAMPLE COSTS Per Acre
		Type	Cost	Hours	Dollars	
LAND PREPARATION						
Disc 2x	5.50					\$ 11.00
Fertilize	3.50	75-100# Urea	15.00			18.50
Border	4.50					4.50
Float 2x	5.00					10.00
TOTAL LAND PREPARATION						\$ 44.00
GROWING PERIOD						
Plant	6.50	Seed 40# @ 20¢ lb.	8.00			\$ 14.50
Irrigate 1lx		3.5 ac ft	17.50	4	18.00	35.50
Fertilize 3x		200# N @ 12¢ lb.	24.00			24.00
GROWING PERIOD						\$ 74.00
GROWING PERIOD & LAND PREPARATION COSTS						\$ 118.00
Land Rent (new lease)						100.00
Cash Overhead--10% of growing, land preparation & land rent						21.80
TOTAL PREHARVEST COSTS						\$ 239.80

Based on 700 pounds of beef produced per acre, the cost per pound of gain would be:

\$0.34

Cost per Cwt of Gain

Calculations below show the cost per cwt of gain at various stocking rates and rates of gain based on the sample cost sheet. The grazing period was assumed to be 150 days.

EFFECTS OF AVERAGE DAILY GAIN AND STOCKING RATE ON COSTS PER CWT GAIN

Average Daily Gain	Stocking Rate (Steers per Acre)						
	2.00	2.50	3.00	3.50	4.00	4.50	5.00
1.0	79.93	63.95	53.29	45.68	39.97	35.53	31.97
1.1	72.67	58.13	48.44	41.52	36.33	32.30	29.07
1.2	66.61	53.29	44.41	38.06	33.31	29.60	26.64
1.3	61.49	49.19	40.99	35.14	30.74	27.33	24.59
1.4	57.10	45.68	38.06	32.63	28.55	25.38	22.84
1.5	53.29	42.63	35.53	30.45	26.64	23.68	21.32
1.6	49.96	39.97	33.31	28.55	24.98	22.20	19.98
1.7	47.02	37.62	31.35	26.87	23.51	20.90	18.81
1.8	44.41	35.53	29.60	25.38	22.20	19.74	17.76
1.9	42.07	33.66	28.05	24.04	21.04	18.70	16.83
2.0	39.97	31.97	26.64	22.84	19.98	17.76	15.99

GENERAL INFORMATION: The acreage and value for annual ryegrass pasture during the last five years are given below.

<u>YEAR</u>	<u>ACRES</u>	<u>VALUE/TON</u>
1973	29000	\$ 130.00
1974	17000	164.00
1975	10000	187.00
1976	7000	187.00
1977	5600	190.00

SOIL PREPARATION: A uniform seed bed is a prerequisite to a good stand. High spots in the field cause an uneven germination, irrigation and poor stands result.

PLANTING RATES, DATES AND VARIETIES: Plant from 20 to 40 pounds of annual ryegrass per acre. Heavier rates may be needed on soils high in salt. Ryegrass may be planted from mid-September through November. Early plantings in September are excellent if weather has cooled down. Most any annual ryegrass variety does well in the Imperial Valley; however, Ucinex is normally a superior yielder. When in doubt, consult your local farm advisor.

FERTILIZER: Apply 50 to 100 pounds of nitrogen as NH_3 preplant. Then apply fifty units of N as ammonium nitrate or NH_3 in the water after each pasturing or as needed. Approximately 200 pounds of total N should be applied during the growing season. The amount to apply depends on the previous crop. Ryegrass needs a lot of nitrogen for economic returns but "don't" overdo it as nitrate poisoning may result. Toxic levels, when present, are normally found in rapidly growing plants. Imperial Valley soils usually contain sufficient phosphorus for ryegrass production if phosphates have been applied to other crops in the rotation.

IRRIGATION: Ryegrass usually thrives under moist soil conditions. Usually quick applications of irrigation water are sufficient unless leaching of salts is intended. Ryegrass will need about eleven irrigations during the growing period.

WEED CONTROL: Weed control is not normally necessary in ryegrass pasture. 2,4-D gives excellent control of broadleaf plants if weed control measures are needed.

PASTURING: It takes about 75 days under good conditions from planting to pasturing ryegrass.

Ryegrass is normally pastured on a 28 to 40 day cycle. Four fields are pastured on a 7 to 10 day schedule. Stocking rate on the overall acreage will range from 3 to 5 head per actual acre planted.

If only $\frac{1}{4}$ of the overall acreage is pastured at one time, the stocking rate for that area would be 4 x 3-5 cattle per acre or 12-20 cattle per acre.

SORGHUMS (GRAIN)--PROJECTED PRODUCTION COSTS--1979

Mechanical operations at custom rates. Labor at \$4.50 per hour (\$3.70 plus Social Security, unemployment insurance, and fringe benefits).

Yield--2.5 tons per acre. 90-160 days to maturity.

OPERATION	Custom Rate	MATERIALS		HAND LABOR*		SAMPLE COSTS Per Acre
		Type	Cost	Hours	Dollars	
LAND PREPARATION						
Disc 2x	5.50					\$ 11.00
Fertilize	4.50	190# N @ 12¢	22.80			27.30
Float 2x	5.00					10.00
List	6.50					6.50
TOTAL LAND PREPARATION						\$ 54.80
GROWING PERIOD						
Planting	6.50	15# seed @ 45¢	6.75			\$ 13.25
Herbicides	3.50	Aatrex®	5.80			9.30
Insecticide 1x	3.50		5.00			8.50
Irrigation 8x		Water 4 ac ft	20.00	5	22.50*	42.50
GROWING PERIOD						\$ 73.55
GROWING PERIOD & LAND PREPARATION COSTS						\$ 128.35
Land Rent (new lease)						100.00
Cash Overhead--10% of preharvest costs & land rent						22.83
TOTAL PREHARVEST COSTS						\$ 251.18
HARVEST COSTS						
Combine	12.00/T per acre plus 30¢ cwt over 1 ton					\$ 21.00
Hauling	3.50 ton					8.75
TOTAL ALL COSTS						\$ 280.93

Cost per ton @ 2.5 tons = \$112.37
Cost per ton @ 3.0 tons = \$ 95.23

* Includes additional shovel, grader work, etc.

<u>YEAR</u>	<u>ACRES</u>	<u>YIELD/ACRE</u>	<u>VALUE/TON</u>
1973	40,000	2.30	\$ 90.00
1974	32,000	2.30	125.00
1975	25,000	2.00	113.48
1976	17,000	2.64	116.00
1977	7,200	2.60	90.00

PLANTING DATES, RATES AND DEPTH: Grain sorghums may be planted from March through July. Test results have shown yields to be lower in plantings after April 15th with all grain sorghum varieties. Ryer types are especially subject to lower yields when planted after mid-April. The open-pollinated types and some of the hybrids have produced satisfactory yields when planted as late as July 15.

The Ryer types and hybrids similar to NK 125 should be flat-planted with grain drill at approximately 30 to 40 pounds of seed per acre. Row spacings with these varieties should be 7 to 14 inches. All other varieties and hybrids should be planted at about 12 to 16 pounds of seed per acre in double row 40 to 42 inch beds, or flat drilled in 14 to 21 inch rows.

The depth of planting will be dependent upon planting technique. Ryer types should be placed to a greater depth (2-2½ inches) than mulch plantings to be irrigated up (¾-1 inch).

VARIETIES: There are more than 30 grain sorghum varieties available to the grower in the Imperial Valley. These include both hybrids and open-pollinated types. Many of these sorghums are well-adapted to the Imperial Valley and will produce satisfactory yields. For the latest varietal testing information, consult the farm advisors' office.

FERTILIZATION: Nitrogen is recommended in amounts varying from 80 to 200 pounds of nitrogen per acre. The amount needed varies with soil type and the previous cropping history. Grain sorghum planted after a vegetable crop such as lettuce, may require only 60 to 80 pounds of nitrogen. However, sorghum planted after a heavy stubble crop of cotton, grain sorghum or barley may require as much as 200 pounds of nitrogen. In heavier soils, the fertilizer may be applied pre-plant or at planting in one application. In sandy soils, however, a pre-plant application of 150 pounds per acre plus a sidedress application of 150 pounds per acre when the plants are 6-8 inches tall gives good yield.

IRRIGATION: Grain sorghum may be planted in a moist soil, or irrigated up. It should be irrigated often enough to prevent curling of leaves. After the grain has reached the stiff dough stage, no further irrigations are required.

WEED CONTROL: Weed control chemicals are commonly used as either preemergence or postemergence treatments. Consult the farm advisors' office for control measures.

INSECT CONTROL: Stink bugs, sorghum greenbug, and desert flea beetle are occasional pests. Contact the farm advisors' office for list of registered and adapted chemicals.

SUDANGRASS HAY--PROJECTED PRODUCTION COSTS--1979

Mechanical operations at custom rates. Labor at \$4.50 per hour (\$3.70 plus Social Security, unemployment insurance, and fringe benefits).

Yield--5.0 tons per acre.

OPERATION	Custom Rate	MATERIALS		HAND LABOR*		SAMPLE COSTS Per Acre
		Type	Cost	Hours	Dollars	
LAND PREPARATION						
Disc 2x	5.50					\$ 11.00
Fertilize	4.50	100# N NH ₃	12.00			16.50
Border	4.50					4.50
Float 2x	5.00					10.00
TOTAL LAND PREPARATION						\$ 42.00
GROWING PERIOD						
Plant	6.50	Seed 30# @ 20¢/lb	6.00			\$ 12.50
Irrigate 8x		3.5 ac ft	17.50	4	18.00*	35.50
Fertilize		100# N Water Run @ 12¢ lb.				12.00
GROWING PERIOD						\$ 60.00
GROWING PERIOD & LAND PREPARATION COSTS						\$ 102.00
Land Rent (new lease)						75.00
Cash Overhead--10% of preharvest costs & land rent						17.70
TOTAL PREHARVEST COSTS						\$ 194.70
HARVEST COSTS						
Swather 2x	7.50					\$ 15.00
Rake 2x	3.25					6.50
Bale (5.0 tons)	@ 8.50/ton					42.50
Haul & stack	0.15/bale					12.75
TOTAL HARVEST COSTS						\$ 76.75
TOTAL ALL HAY						\$ 271.45

Cost per ton @ 5 tons = \$54.29
Cost per ton @ 6 tons = \$47.08

* Includes shovel labor, pipe setting, miscellaneous tractor work.

GENERAL INFORMATION: The average yields for Sudangrass hay during the past five years has ranged from 3 to 6 tons per acre with an average selling price of \$26.00 to \$46.50 per ton. The average yield and value for Sudangrass during the last three years are given below:

<u>YEAR</u>	<u>ACRE</u>	<u>YIELD/ACRE</u>	<u>VALUE/TON</u>
1975	13,000	5.5	\$ 43.00
1976	26,000	4.3	46.50
1977	6,600	4.5	45.00

SOIL PREPARATION: A uniform seed bed is necessary to obtain a good stand of Sudangrass. High spots in the field cause an uneven germination and poor stands result. Low spots in the field will scald out, decreasing the stand population considerably.

PLANTING RATES, DATES AND VARIETIES: Sudangrass should be planted with 20 to 40 pounds of seed per acre. Sudangrass may be planted from March to June with a drill or broadcaster. The variety Piper has always performed well in Imperial Valley. There are also a number of other commercial varieties available.

FERTILIZATION: Apply 100 pounds of nitrogen as NH_3 preplant. Apply 80 to 100 lbs. of nitrogen after the first hay crop is cut. Later applications of nitrogen may be applied in the irrigation water if necessary.

IRRIGATION: Sudangrass requires a lot of moisture but will scald out during the hot summer days if water is left on for a long period of time or if drainage is poor. Damage is more likely to occur when irrigation water is applied just after the hay has been taken off. Approximately eight irrigations are applied during the growing season.

WEED CONTROL: Weed control is not normally necessary in Sudangrass production. However, 2,4-D gives excellent control of broadleaf plants if required.

HARVESTING: Sudangrass may be baled from June to October. Normally two to three cuttings will be harvested. Sudangrass may sometimes be harvested by pasturing.

SUGAR BEETS--PROJECTED PRODUCTION COSTS--1979

Mechanical operations at custom rates. Labor at \$4.50 per hour (\$3.70 plus Social Security, unemployment insurance, and fringe benefits).

Yield--26.0 tons per acre.

OPERATION	Custom Rate	MATERIALS		HAND LABOR		SAMPLE COSTS Per Acre
		Type	Cost	Hours	Dollars	
LAND PREPARATION						
Plow or subsoil	16.50					\$ 16.50
Disc 2x	5.50					11.00
Build & break borders	9.00					9.00
Flood		Water .9 ac ft	4.50	2	9.00 ^{d/}	13.50
Disc 2x	5.50					11.00
Fertilize	3.25	300# 11-48-0	27.75			31.00
Float	5.00					5.00
List	6.50					6.50
TOTAL LAND PREPARATION						\$ 103.50
GROWING PERIOD						
Incorporate	12.75	Herbicide	8.00			\$ 20.75
Plant	8.50	Seed 10# coated	9.00			17.50
Weed Control	3.50	Herbicide	14.50			18.00 ^{a/}
Thin	24.00	Machine (synchronous thinner)				24.00
Cultivate 3x	6.00					18.00
Fertilize 2x	6.50	160# N	40.00			53.00
Weed Control				11	49.50	49.50 ^{b/}
Pest Control 8x	3.50	Pesticide	57.50			85.50
Irrigate 12x ^{c/}		Water 7 ac ft	35.00	8	36.00 ^{d/}	71.00
GROWING PERIOD						\$ 357.25
GROWING PERIOD & LAND PREPARATION COSTS						\$ 460.75
Land Rent (new lease)						125.00
Cash Overhead--10% of preharvest costs & land rent						58.58
TOTAL PREHARVEST COSTS						\$ 644.33
HARVEST COSTS						
Dig	1.85 per clean ton @ 26.0 tons per acre					\$ 48.10
Haul	1.60 per clean ton @ 26.0 tons per acre for a 15-mile average haul					41.60
Railroad freight ^{e/}	2.50 per clean ton @ 26.0 tons per acre					65.00
TOTAL ALL COSTS						\$ 799.03

Cost per ton for 26.0 ton = \$30.73
Cost per ton for 30.0 ton = \$27.43

^{a/} Post application of either IPC[®] or Betanal[®] may be needed.

^{b/} Layby application may be needed of TOK[®] or Eptam[®].

^{c/} If sprinklers are used for germinating crop, additional cost is \$87.50/ acre.

^{d/} Includes shovel labor, pipe setting and miscellaneous tractor work.

^{e/} Union and Spreckles Sugar Companies have freight charges.

GENERAL INFORMATION: The average yield, acreage and value for sugar beets during the last five years are given below.

<u>YEAR</u>	<u>ACRES</u>	<u>YIELD/ACRE</u>	<u>VALUE/TON</u>
1973	64,000	24.7	\$ 20.20
1974	65,000	26.8	51.18
1975	65,000	24.9	35.39
1976	58,000	25.5	25.61
1977	49,500	21.67	24.62

SEED BED PREPARATION: Costs based in the guideline on flat pre-irrigation due to slightly lower costs, tendency towards lowering salinity levels, and usually better soil condition in the seed bed.

SEEDING RATES: A slightly greater amount of seed is generally used in early plantings due to difficulty in getting stands in the extremely hot weather.

PLANTING DATES: The planting season begins August 20 and continues through October.

VARIETIES: The varieties USH 10 or 9 are recommended because of their good virus yellows tolerance and yield ability.

FERTILIZATION: Phosphate--broadcast before listing.

Nitrogen--Apply 1/3 of required amount with phosphate preplant, 1/3 at thinning and final 1/3 before mid-December. Late applications of nitrogen will reduce sugar percentage and purity.

IRRIGATION: Irrigation is by furrows. The crop is "irrigated up" initially and may require "watering back" within four or five days to get a stand. Never allow the crop to wilt or suffer from shortage of water. Ten to 20 irrigations may be required. Last irrigation should be applied at least 30 days prior to harvest.

WEED CONTROL: Consult weed control Farm Advisor for list of registered and adapted chemicals.

PESTS AND DISEASES: Pest populations vary from year to year and costs vary accordingly. A number of insects and diseases may be a problem during the growing season. Growers planting extremely early should exercise all caution against damage by inspecting fields often and carefully. Crickets, flea beetles and armyworms normally occur as seedling pests and are especially damaging in early plantings. From January to March the green peach aphid is a primary pest. Spider mites and leafhoppers occur as late season pests. Consult Farm Advisor for list of registered and adapted chemicals.

Nematodes can be a problem. Growers should carefully clean all nematode infested machinery moving into beet fields. Crop rotation is the best control.

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