U.C. COOPERATIVE EXTENSION

SAMPLE COST TO ESTABLISH AND PRODUCE

CABBAGE

IMPERIAL COUNTY – 2000

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For an explanation of calculations used for the study refer to the attached General Assumptions or call the author, Keith S. Mayberry, at the Imperial County Cooperative Extension office, (619)352-9474, or e-mail at: ksmayberry@ucdavis.edu.

FOREWORD

We wish to thank growers, pest control advisors, seed companies, transplant producers, contract harvesters, fertilizer dealers, and equipment companies for providing us with the data necessary to compile this circular. Without them we could not have achieved the accuracy needed for evaluating the cost of production for the dynamic and important vegetable industry in Imperial County.

The information presented herein allows one to get a "ballpark" idea of vegetable production costs and practices in the Imperial County. They do not reflect the exact values or practices of any grower or shipper, but are rather an amalgamation of countywide prevailing costs and practices. Exact costs incurred by individual growers depend upon many variables such as weather, land rent, seed, choice of agrichemicals, location, etc. No exact comparison with individual grower practice is possible or intended. The budgets do reflect, however, the prevailing industry trends within the region.

Overhead usually includes secretarial and office expenses, supplies, donations, utilities, transportation, accountants, insurance, safety training, permits, etc. In most of the crop guidelines contained in this circular we used 13% of the total of land preparation, growing costs and land rent to estimate overhead. For crops that require additional labor or extra operations (i.e. leaf lettuce) we used 17% overhead to account for the additional expenses.

Since all of the inputs used to figure production costs are impossible to document in a single page, we have included extra expense in man-hours or overhead to account for such items as pipe setting, motor grader, water truck, shovel work, etc. Whenever possible we have given the costs of these operations per hour.

Not included in these production costs are expenses resulting from management fees, loans, supervision, or return on investments. The crop budgets also do not contain expenses encumbered for cleanup discing, road and ditch maintenance, perimeter weed control. If all the above items were taken into account, the budget may need to be increased by 7-15%.

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2000-2001 VEGETABLE CROPS PREVAILING RATES
IMPERIAL COUNTY

HEAVY TRACTOR WORK & LAND PREPARATION

OPERATION	$/ACRE
Plow	27.75
Subsoil, 2nd gear	38.75
Subsoil, 3rd gear	32.75
Landplane	12.00
Triplane	11.00
Chisel 15"	24.75
Wil-Rich chisel	14.75
Big Ox	21.25
Slip plow	39.00
Pull/disc borders	6.00
Make cross checks (taps)	6.00
Break border	5.75
Disc, stubble	21.75
Disc, regular	11.50
List 40" beds	13.50
Float	10.00
Disc, borders	11.25
Laser (acre)	34.00-38.00
Dump (scraper) borders	14.00

PLANTING, CULTIVATING & LIGHT TRACTOR WORK

	$/HR
Power mulch dry	23.00
Power mulch with herbicide	27.00
Shape 40" beds	9.50
Precision plant 40" beds	17.50
Cultivate 4-row 40" beds	13.00
Spike 40" beds	9.75
Spike and furrow 4-rows 40" beds	10.25
Furrow out 40-42" beds	9.75
Lilliston 40" beds	10.75
Lilliston 40" beds with/herbicides	14.50
Inject fertilizer and furrow out 40" beds	13.50
Fertilize dry and furrow out 40" beds	13.50
Broadcast dry fertilizer >300lb/a	7.00
Broadcast dry fertilizer <300lb/a	6.00
Ground spray 4-row	10.00
Ground spray 8-row	9.00
Layby herbicide	22.00

PREVAILING RATES BY THE HOUR

	$/HR
Motor grader	50.00
Backhoe	42.50
Water truck	39.00
Wheel tractor	32.00
Scraper	27.00
Versatile	53.00
D-6	46.50
D-8	65.00
Burn ditches	28.00
Buck ends of field	30.00
Pipe setting (2 men)	33.00
Laser	70.00
Work ends	40.00

IRRIGATION

Sprinkler irrigate	$125-160.00/acre
1 acre-foot of water	14.56
Sprinkler irrigate carrots	155.00

*Note – Cultural rates for specific crop operations listed on crop budgets.

CABBAGE CULTURE 2000-2001

Annual acreage, yield, and value of fresh market cabbage in Imperial County, CA (1995-1999)

Year	Acres	Yield/Acre*	Value/Acre
1999	1,389	522	$2,155
1998	1,126	716	$4,226
1997	1,120	628	$2,790
1996	710	687	$2,925
1995	757	603	$2,849

*50 lb cartons

Source: Imperial County Agricultural Commissioner's Reports 1995-99

PLANTING-HARVESTING DATES Cabbage is planted from mid-September through October. Harvesting begins in December and continues through February. The demand for local cabbage depends upon the availability of the cabbage harvested in coastal California and Texas.

The average yield varies according to market price, but may reach 1,000 cartons per acre. Normally, yields reflect market demand rather than actual yield. If prices are too low, muchof the harvestable crop remains in the field. Oversupply from competing markets depresses price rapidly to the point where harvesting is impractical. A shortage in the cabbage supply, however, can create windfall profits. Cabbage is a very high risk crop!

Some cabbage is grown under contract with fast food outlets and coleslaw manufacturers.

VARIETIES Headstart *Asgrow*; Grenadier *Novartis*; Charmant *Sakata* are popular green varieties. Commonly used red varieties include: Primero *Bejo*; Red Jewel *Sakata;* Sombrero *Bejo*; Cardinal *Harris Moran* and Red Rookie *Sakata*

PLANTING INFORMATION Double seed lines on 40 inch beds are used for cabbage production. The seed is normally planted with a precision planter at 2 to 3 inches within-row spacing, at a depth of ¼ inch or less. Seed lines are usually 13 inches apart.

When seed are placed 3 inches apart within rows, on 2 seed lines per 40 inch bed, roughly 104,000 seed are required per acre. When plants develop 2 to 3 true leaves, seedlings are thinned to 12 to 14 inches within rows.

IRRIGATION Sprinkler irrigation is used to germinate the crop. Once the seedlings have emerged, the field is then converted to furrow irrigation.. Cabbage grows well on medium-and moderately-heavy soil. Cabbage has intermediate salt tolerance.

FERTILIZERS Five hundred pounds of 11-52-0 broadcast prior to listing is standard practice. Sidedress applications of nitrogen (60-80 lb N/acre) are common. Ammonium nitrate or UAN32 solutions are often used for sidedress application.

PESTS AND DISEASES Insect pests of cabbage include crickets, cutworms, flea beetles, saltmarsh caterpillars, aphids, thrips, and cabbage looper. Once an insect burrows into cabbage heads, chemical control is nearly impossible.

Cabbage should not be planted following sugar beets due to possible cyst nematode infection (*Heterodera schachtii*). Downy mildew (*Peronospora parasitica*) may require control if moist, cool conditions persist.

Black rot (*Xanthomonas campestris* pv. *campestris*) occurs occasionally in Imperial County. Plant disease-free seed or transplants.

Oedema is a physiological disorder of cabbage that is manifested by pits and craters on the epidermis of the leaves. It is thought to be caused by over watering, especially during cloudy, humid weather. A similar condition may occur on the outer leaves of cabbage as a result of sand blasting.

Blind plants are created by mechanical damage or genetic defects. Bird and insect feeding are often the culprits.

HARVESTING Fields are harvested by hand. Cabbage is packed 24 heads per bulge-packed carton. A carton may weigh over 55 pounds. Head counts can vary from 18 to 24 heads per carton, however many sales are made on the basis of net weight. Cabbage is normally sold by the pound at retail stores.

Cone-shaped cabbage heads are not acceptable in markets on the West Coast and in the Pacific Northwest. Some cabbage is grown under contract with fast food outlets for coleslaw and salad mixes.

Cabbage may be either hydrovac or vacuum cooled. It should be stored under refrigeration after cooling.

POSTHARVEST Cabbage should be stored at 32°F and a 98 percent relative humidity. Storing cabbage at low humidity causes wilting and senescence. Cabbage is sensitive to ethylene and should not be stored near ethylene sources (i.e. ripening fruits), because loss of green color and abscission of the leaves will result.

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For more information see “Cabbage Production in California”, DANR Publication 7208 available from the Imperial County Cooperative Extension Office or for a free download from the Internet go to http://anrcatalog.ucdavis.edu/specials.ihtml

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CABBAGE PROJECTED PRODUCTION COSTS 2000-2001

Hand labor at $7.75per hour ($5.75 plus SS,unemployment insurance, and transportation, supervision and fringe benefits).

Yield--500 cartons per acre 50 lbs. per carton. Hybrid variety

OPERATION	Cost	Materials		Hand Labor		Cost
		Type	Cost	Hours	Dollars	Per acre
LAND PREPARATION						
Stubble disc	21.75					21.75
Subsoil	38.75					38.75
Disc 2x	11.50					23.00
Landplane 2x	12.00					24.00
Border, cross check & break borders	17.75					17.75
Flood		Water 1 ac/ft.	14.56	1	7.75	22.31
Disc 1x	11.50					11.50
Triplane 1x	11.00					11.00
Fertilize, double spread	8.00	500 lb. 11-52-0	63.75			71.75
List 40" beds	13.50					13.50
TOTAL LAND PREPARATION						**255.31**
GROWING PERIOD						
Power mulch beds 1x	30.00					30.00
Preplant whitefly control	10.00	Admire	75.00			85.00
Precision plant	17.50	Seed 104M	260.00			277.50
Spray herbicide	12.00					12.00
Sprinkler irrigate	145.00					145.00
Apply insecticide in water		Insecticide	20.00			20.00
Thin				10	77.50	77.50
Cultivate 3x	13.00					39.00
Spike 2x	9.75					19.50
Fertilize & furrow out 2x	13.50	120 lb. N @ .35	42.00			69.00
Water-run fertilizer		60 lb. N @ .35	21.00			21.00
Hand weed 1x				12	93.00	93.00
Irrigate 6x		Water 3 ac/ft.	43.68	7	54.25	97.93
Gated pipe	53.00					53.00
Insect control 8x	9.50	Insecticides	211.00			287.00
Disease control 2x	10.50	Fungicides	49.50			70.50
Stubble disc	21.75					21.75
TOTAL GROWING PERIOD						**1418.68**
GROWING PERIOD & LAND PREPARATION COSTS						1673.99
Land Rent (net acres)						225.00
Cash Overhead-----	13 % of preharvest costs & land rent					246.87
TOTAL PREHARVEST COSTS						**2145.86**
HARVEST COST						
Cut, pack, haul, cool and sell	500 cartons @	3.75	per carton			1875.00
TOTAL ALL COSTS						**4020.86**

PROJECTED PROFIT OR LOSS PER ACRE

		Price/ 50 lb. carton (dollars)					
		5.00	6.00	7.00	8.00	9.00	**Break-even $/carton**
	500	-1521	-1021	-521	-21	479	8.04
Cartons	600	-1396	-796	-196	404	1004	7.33
per	700	-1271	-571	129	829	1529	6.82
acre	800	-1146	-346	454	1254	2054	6.43
	900	-1021	-121	779	1679	2579	6.13

* Harvest cost varies with the shipper, the field conditions and the market