U.C. COOPERATIVE EXTENSION

SAMPLE COST TO ESTABLISH AND PRODUCE

MIXED MELONS

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.

MIXED MELON CULTURE 2000-2001

Annual acreage, yield, and gross value of mixed melons in Imperial County, CA (1995-1999)

Year	Acres	Yield/Acre*	Gross Value/
1999	2,306	432	$2,640
1998	1,263	662	$3,340
1997	1,793	576	$3,627
1996	1,820	761	$3,978
1995	1,770	367	$2,351

*40 pound carton equivalent
Source: Imperial County Agricultural Commissioner's Reports 1995-99

PLANTING-HARVESTING The term "mixed melons" includes the following muskmelons: honeydew, crenshaw, casaba, juan canary, santa claus, and persian. The greatest acreage is sown to honeydews and crenshaws.

Mixed melons are planted in January for a late-May to July harvest. Mixed melons may also be planted in July and early August for harvest starting in October until first frost. Yields vary with season, disease incidence, and type of melon. There is potential for a field to yield 1200-1300 cartons per acre, but usually yields are considerably less.

VARIETIES AND PLANTING Commonly used mixed melon varieties include: Green Flesh Honeydew *Various*; Silver World *Known You*; T-542 *Takii*; Santa Fe *Peto*; Morning Ice *Harris Moran*; Honeybrew *Sakata*. White Crenshaw *Hollar*

PLANTING INFORMATION The mid-bed trench system involves the use of a bed shaper to produce a trench or groove in the center of an 80-inch bed. The shape of the trench varies from grower to grower, but normally they are 6 to 10 inches wide at the bottom, 20 inches wide at the top, and 12 inches deep. Trenches are seeded at the bottom using either a random flow planter or an air-type, vacuum precision planter. Pre-emergence herbicide is sprayed in the trench. A tractor-mounted, plastic-mulch laying machine is used to stretch a 40 inch wide sheet of 1 to 1½ mm plastic sheet over the trench and to secure the edges with soil.

Fields are furrow irrigated to wet the seed lines. No additional irrigation is needed for the next 40 to 50 days. Water vapor inside the tunnel condenses on the plastic film and drips back to the soil recycling the water.

After temperatures begin to rise and the plants touch the plastic, ventilation is needed to prevent injury. Holes are punched by hand or by machine, and the water vapor is allowed to escape. Plants will acclimate to the lower relative humidity. After a few days, the plastic is removed and the plants are thinned.

Unless the plastic mulch is laid on a sloping bed, rain may collect causing the plastic film to sag and stretch into trenches, thus injuring plants. Some growers have to go through the field puncturing holes in the film to let puddled water escape.

An alternative method of culture for spring melon production is slant-bed or "Yuma-bed". This time-proven cultural method was developed to orient the south face of the bed toward the winter sun. The sun's rays strike the soil surface at a nearly perpendicular angle, converting light energy into heat. Flatter beds reflect a greater portion of the incoming radiation and are therefore cooler. Maximum bed heating is achieved when the bed angle is roughly 35-37 degrees from horizontal.

Seed is planted ½" deep on 80-inch beds. Custom-built, slant-bed planters using random flow seeding units are common. Air planters may be used for precision planting. Seed lines are located midway up the slope. Care must be taken to locate the correct seed line position as the beds will be reworked and reformed during the season. Forming a bed with a depression at the crown will increase the incidence of fruit and root rotting fungi.

After the melons are thinned to approximately 12 inches in-row, the beds are worked to relocate the seed line. Soil is shaved off the top of the beds and into the furrow. After several passes with small tractor-mounted discs, the field is virtually flat with seed lines 80 inches apart. Sidedress fertilizer is applied and new furrows are made for irrigation.

SOILS Well-drained soils are preferred for cantaloupes. Sandy or silt loams are sometimes selected for the earliest crop. Heavier soils are preferred because of their greater water holding capacity which slows the onset of vine collapse. Beds should be left cloddy to allow for maturing melons to develop with minimal soil contact and good aeration.

Fields located in the northern portion of the valley near the Salton Sea are preferred for the early melon crops. This area is less subject to freezing due to the influence of the sea. Spring cantaloupes are also planted in the Bard/Winterhaven area of the county.

IRRIGATION Melons are usually furrow irrigated. Sprinkling tends to cool the soil and cantaloupes do not respond well to prolonged or frequent irrigation. Some cantaloupes are grown using drip irrigation and plastic mulched beds.

Irrigations are scheduled as needed to allow for moisture to be replaced in the beds. Excessive saturation can stimulate root rot diseases and ground spotting of fruit.

The last irrigation is normally scheduled one week prior to harvest. Excessive moisture during harvest may increase ground spotting, and fruit rots.

FERTILIZERS Most growers apply ammoniated phosphate such as 10-34-0 liquid in the beds at planting or 11-52-0 broadcast prior to listing the beds. As much as 150 pounds of nitrogen is sidedressed. Normally UAN32 or AN20 may be used as sidedress fertilizers.

POLLINATION At least one colony of bees per acre is recommended and 1½ colonies is better. The bees should be distributed on at least two sides of a 40-acre field; distribution of bees within fields is even better. Research has indicated that yields are increased with heavy bee saturation.

Bisexual, or fruit-producing flowers are only open for one day. On the average, a well-pollinated flower will receive at least 15 bee visits during this time. If poorly pollinated, the flower aborts.

The highest quality, earliest maturing, and largest fruit are produced near the crown of the plant. Therefore, it is important that an adequate supply of bees be delivered to the field when the first male blossoms develop.

PEST AND DISEASE CONTROL Spring cantaloupes are subject to a number of insect problems including cutworms, aphids, mites, loopers, leafhoppers, and leafminers.

The silverleaf whitefly causes damage to late season melons by extracting massive amounts of plant fluids. The whitefly excrement is a food source for fungal growth which is unsightly and difficult to remove from the net of mature cantaloupes. Heavy whitefly feeding may cause loss of the entire crop.

Sudden wilt caused by *Pythium* sp. is a serious problem affecting melons after fruit set. The problem is lessened by using alternate furrow irrigation allowing for a portion of the root zone to remain dry.

Mosaic viruses including zucchini yellow mosaic (ZYMV), watermelon mosaic II (WMV), papaya ringspot (PRSV), and cucumber mosaic (CMV) are vectored by various aphid spp. during the spring. There is no control for these viruses.

Powdery mildews caused by *Sphaerotheca fuliginea*, or *Erysiphe cichoracearum* are foliar diseases favored by warm weather and high moisture. Dusting sulfur and other agrichemicals are used to control these organisms.

Vine decline *(Monosporascus cannonballus)* is a serious soilborne melon disease. Fields may collapse near harvest and produce a very limited yield. Other diseases of lesser importance

include charcoal rot caused by *Macrophomina phaseolina*, root rots caused by *Fusarium* spp., *Pythium* spp. and *Rhizoctonia solani*, and gummy stem blight caused by *Didymella bryoniae.*

Fusarium fruit rot caused by *F. roseum* can cause severe damage. This disease can be controlled, but preventative control measures must be applied before the onset of disease if it is to be effective. Otherwise, control measures are useless.

Weeds cause serious problems in cantaloupe production. Herbicides have not been completely successful, forcing growers to rely on hand weeding.

HARVESTING. Mixed melons are field-packed on machines, or picked and hauled to the edge of the field to small, temporary packing sheds. The melons are packed into cardboard cartons containing a partition. There are 5, 6, or 8 melons per 30 pound carton.

All cartons are packed using a partition which serves as a barrier or cushion between melons to prevent bruising, scuffing and to "tighten up the presentation of the pack".

Honeydews, orange flesh melons, persians, and casabas are mostly spherical in shape (group 1). Juan canary and santa clause types are football shaped (group 2). Crenshaws are tear drop shaped (group 3).

There are methods of packing or presenting for each fruit group. Group 1 is the easiest to pack. Fruit are oriented blossom-end-up. Group 2 is packed on the side, sometimes larger fruit have to be leaning on the carton or divider. Group 3 is the most difficult to handle and the most delicate melon. Crenshaws must be placed with the blossom end up or breakdown of the fruit will occur rapidly. The cartons are forced air cooled prior to shipping.

POSTHARVEST HANDLING Relative humidity should be 90 percent or more to prevent fruit shriveling. This is a lower humidity level than for cantaloupes.

Mixed melons are sensitive to chilling injury and should not be stored below 41°F. Honeydews, crenshaws and persians store best at 45°F and casabas at 50°F. If temperatures are too low for storage, the rind will break down and surface decay will set in. In addition, abnormal softening and off-flavors will result when fruit are brought up to room temperature. Honeydews can be stored at temperatures as high as 65°F and will keep for 2-3 weeks.

An ethylene treatment of 5000 ppm for 18-24 hours has been used to ripen and soften physiologically mature honeydews. Immature fruit will not ripen with this treatment.

For more information on mixed melons, see “Mixed Melon Production in California”, DANR Publication 7209 available from the Imperial County Cooperative Extension Office or for a free download from the Internet go to http://anrcatalog.ucdavis.edu/specials.ihtml

MIXED MELON PROJECTED PRODUCTION COSTS 2000-2001

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

Yield--600 30 lb.-cartons per acre. **HONEYDEWS** Hybrid variety

OPERATION	Cost	Materials		Hand Labor		Cost
		Type	Cost	Hours	Dollars	Per acre
LAND PREPARATION						
Stubble disc 1x	21.75					21.75
Disc 2x	11.50					23.00
Landplane	12.00					12.00
Border, cross check and break borders	17.75					17.75
Flood		Water 1 ac-ft	14.56	1	7.75	22.31
Disc 2x	11.50					23.00
Spread fertilizer	8.00	500 lb. 11-52-0	63.75			71.75
List and re-run beds	36.00					36.00
TOTAL LAND PREPARATION						**227.56**
GROWING PERIOD						
Shape beds and plant	18.50	Hybrid seed 20M	500.00			518.50
Systemic insecticide	10.00	Admire	75.00			85.00
Spray herbicide	10.50	Prefar	33.00			43.50
Back-fill furrow	10.00					10.00
Thin				7	54.25	54.25
Move bed top 1st time	18.00					18.00
Cultivate/move beds 3x	15.00					45.00
Center beds	15.50					15.50
Work bed tops	12.75					12.75
Spike 2x	9.75					19.50
Sidedress fertilizer	12.50	80 lb. N @ .35	28.00			40.50
Hand weed 1x				4	31.00	31.00
Furrow out	9.75					9.75
Layby herbicide	22.00	Treflan	4.00			26.00
Pollination		1.5 hives @ $25 ea	37.50			37.50
Irrigate 5x		Water 3 3/4 ac/ft	54.60	8	62.00	116.60
Water-run fertilizer		40 lb. N @ .35	14.00			14.00
Insect control 2x	9.50	Insecticides	120.00			158.00
Disease control 1x	10.00	Fungicides	30.00			40.00
Stubble disc	21.75					21.75
TOTAL GROWING PERIOD						**1317.10**
GROWING PERIOD & LAND PREPARATION COSTS						1544.66
Land Rent (net acres)						200.00
Cash Overhead------	13 % of preharvest costs & land rent					226.81
TOTAL PREHARVEST COSTS						**1971.47**
HARVEST (field pack)						
Pick, pack, haul, cool, and sell	600 cartons @	4.00 per carton				2400.00
TOTAL OF ALL COSTS						**4371.47**

PROJECTED PROFIT OR LOSS PER ACRE
price/ 30 lb.carton (dollars)

		5.00	6.00	7.00	8.00	9.00	**Break-even $/carton**
	400	-1571	-1171	-771	-371	29	8.93
Cartons	500	-1471	-971	-471	29	529	7.94
per	600	-1371	-771	-171	429	1029	7.29
acre	700	-1271	-571	129	829	1529	6.82
	800	-1171	-371	429	1229	2029	6.46

* Harvest costs vary with the shipper, the field conditions and the market value.