

U.C. COOPERATIVE EXTENSION

SAMPLE COST TO ESTABLISH AND PRODUCE

MIXED MELONS



IMPERIAL COUNTY – 2003

Prepared by:

Keith S. Mayberry
Herman Meister

Farm Advisor, U.C. Cooperative Extension, Imperial County
Agronomy Advisor, U.C. Cooperative Extension, Imperial County

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.

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FOREWORD

We wish to thank growers, pest control advisors, chemical applicators and dealers, custom farm operators, fertilizer dealers, seed companies, contract harvesters, equipment companies, and the Imperial County Agricultural Commissioners office 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 field crop industry in Imperial County.

The information presented herein allows one to get a "ballpark" idea of field crop production costs and practices in the Imperial County. They do not reflect the exact values or practices of any one grower, but are rather an average 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, time of planting, 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, general farm supplies, communications, utilities, farm shop, transportation, moving farm equipment, 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.

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, bird and rodent control, etc. Whenever possible we have given the costs of these operations per hour listed on the cultural operations page.

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

Where applicable we have used terminology that is commonly used in the agricultural industry. These terms are compiled in a glossary at the end of the circular. We feel that an understanding of these terms will be useful to entry-level growers, bankers, students and visitors.

Herman S Meister & Keith S. Mayberry
(Principal researchers and editors)
Vegetable Crops and Agronomy Advisors

Contributors: Eric T. Natwick
Tom A. Turini
Jose L. Aguiar
Khaled M. Bali
Juan N Guerrero

**2002-2003 Field/Vegetable Prevailing Rate for Field Operations
IMPERIAL COUNTY**

**HEAVY TRACTOR WORK & LAND
PREPARATION**

<u>OPERATION</u>	<u>\$/ACRE</u>
Plow.....	30.50
Subsoil, 2 nd gear.....	39.00
Landplane	12.75
Triplane	11.25
Chisel 15".....	25.00
Wil-Rich chisel.....	16.00
Big Ox	24.00
Slip plow.....	41.00
Pull/disc borders	6.75
Make cross checks (taps).....	6.25
Break border	6.00
Disc, stubble	21.00
Disc, regular.....	12.50
Corrugate	11.00
Disc, regular with ring roller.....	13.50
List 30" beds 12-row	15.00
List 40" beds 8-row	15.00
Float.....	10.00
Disc, borders.....	7.00
Dump (scraper) borders	14.50

LIGHT TRACTOR WORK

Power mulch dry.....	25.00
Power mulch with herbicide	28.00
Shape 30" 6 row	10.75
Shape 40" 4 row	10.75
Plant 30" beds nonprecision	20.00
Plant 40" beds nonprecision	18.00
Precision plant 30" beds	22.00
Precision plant 40" beds	20.00
Mulch plant wheat	19.50
Plant alfalfa (corrugated).....	17.50
Plant bermudagrass (flat).....	13.75
Plant sudangrass.....	14.75
Cultivate 30" beds 4-row	16.00
Cultivate 40" beds 4-row	14.00
Spike 30" beds 4-row.....	13.25
Spike 40" beds 4-row.....	11.25
Spike and furrow out 30" 4-row	14.00
Spike and furrow out 40" 4-row	12.00
Furrow out 30" beds 4-row.....	13.25
Furrow out 40" beds 4-row.....	11.25
Lilliston 30" beds 6-row	13.00
Lilliston 40" beds 4-row	13.00
Lilliston 30" beds with/herbicides 6-row.....	15.00

Lilliston 40" beds with/herbicides 4 -row.....	15.00
Inject fertilizer & furrow out 30" beds 4-row	15.00
Inject fertilizer & furrow out 40" beds 4-row	13.00
Fertilize dry & furrow out 30" beds.....	17.00
Fertilize dry & furrow out 40" beds.....	15.00
Flat inject fertilizer NH ₃	15.00
Broadcast dry fertilizer	7.00
Ground spray 40" 8-row	12.00
Ground spray 30" 8-row	14.00
Chop cotton stalks.....	13.75

HARVEST COSTS Field Crops

	<u>BY UNIT</u>
Combine alfalfa seed	41.75/acre
Windrow alfalfa seed	17.50/acre
Rake bermudagrass	5.00/acre
Swath bermudagrass	13.50/acre
Swath sudangrass.....	11.25/acre
Rake sudangrass.....	5.25/acre
Swath alfalfa	8.00/acre
Rake alfalfa.....	4.50/acre
Bale (all types of hay- small bale)	0.65/bale
Haul & stack hay – small bale	0.25/bale
Bale (large bale 4X4).....	10.00/bale
Bale (large bale Jr. 3X4).....	9.00/bale
Stack & load large bale.....	6.00/bale
Dig sugar beets	2.60/clean ton
Haul sugar beets.....	2.45/clean ton
Combine wheat	15 per acre + 0.55 /cwt over 1 ton
Haul wheat.....	5.50/ton
Combine bermudagrass seed 1 st time	40.00/acre
Combine bermudagrass seed 2 st time	25.00/acre
Haul bermudagrass seed (local).....	175/load
Haul bermudagrass seed (Yuma).....	300/load

MISCELLANEOUS OPERATIONS BY THE HOUR

Motor grader.....	48.00
Backhoe	45.00
Water truck	40.00
Wheel tractor	35.00
Scraper.....	36.00
Versatile.....	56.00
D-6.....	56.00
D-8.....	70.00
Buck ends of field.....	28.00
Pipe setting (2 men)	37.00
Laser	88.00
Work ends (disc out rotobucks).....	35.00

MIXED MELON CULTURE 2002-2003

Annual acreage, yield, and gross value of mixed melons
in Imperial County, CA (1997-2001)

Year	Acres	Yield/Acre*	Gross Value/ Acre
2001	1,226	777	\$4,072
2000	2,293	368	\$2,021
1999	2,306	432	\$2,640
1998	1,263	662	\$3,340
1997	1,793	576	\$3,627

*40 pound carton equivalent

Source: Imperial County Agricultural Commissioner's Reports 1997-2001

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 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*; Honey Ace *Takii*; Honeycomb *Takii*; Saturno *Seminis*; Santa Fe *Seminis*; Morning Ice *Harris Moran*; Honeybrew *Sakata*. White Crenshaw *Hollar*

PLANTING INFORMATION In spring plantings, the mid-bed trench system (hoopless tunnel) 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 a random flow planter or an air-type, vacuum precision planter. Pre-emergence herbicide may be 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 water puddles drain inside the tunnel.

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 fertilizer 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. The flower will abort if insufficiently pollinated.

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. There are systemic insecticides to reduce whitefly population.

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

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 divider. There are 5, 6, or 8 melons packed 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 teardrop 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.html>

MIXED MELON PROJECTED PRODUCTION COSTS 2002-2003

Hand labor at \$9.25per hour (\$6.75 plus SS, unemployment insurance, transportation, supervision, workman's compensation,and fringe benefits).

Yield--600 30 lb.-cartons per acre.

HONEYDEWS Hybrid variety

OPERATION	Cost	Materials		Hand Labor		Cost
		Type	Cost	Hours	Dollars	
LAND PREPARATION						
Stubble disc 1x	21.00					21.00
Disc 2x	12.50					25.00
Triplane 1x	11.25					11.25
Border, cross check and break borders	19.00					19.00
Flood		Water 1 ac-ft	16.00	1	9.25	25.25
Disc 2x	12.50					25.00
Fertilizer, spread	7.00	500 lb. 11-52-0	63.75			70.75
List beds	19.00					19.00
TOTAL LAND PREPARATION						216.25
GROWING PERIOD						
Shape beds, plant and systemic insecticide	22.00	Hybrid seed 20M	575.00			597.00
		Admire	75.00			75.00
Spray herbicide	12.50	Prefar	25.00			37.50
Back-fill furrow	12.00					12.00
Thin				7	64.75	64.75
Cultivate/move beds 3x	16.00					48.00
Center beds	18.00					18.00
Work bed tops	12.00					12.00
Sidedress fertilizer and furrow out	17.00	80 lb. N @ .32	25.60			42.60
Hand weed 1x				4	37.00	37.00
Furrow out	9.75					9.75
Layby herbicide	12.50	Treflan	5.00			17.50
Pollination		1.5 hives @ \$27 ea	40.50			40.50
Irrigate 5x		Water 3 3/4 ac/ft	60.00	8	74.00	134.00
Water-run fertilizer		40 lb. N @ .32	12.80			12.80
Insect control 4x	10.00	Insecticides	100.00			140.00
Disease control 1x	10.00	Fungicides	30.00			40.00
Bust beds (cleanup)	13.00					13.00
TOTAL GROWING PERIOD						1351.40
GROWING PERIOD & LAND PREPARATION COSTS						1567.65
Land Rent (net acres)						200.00
Cash Overhead-----	13 % of preharvest costs & land rent					229.79
TOTAL PREHARVEST COSTS						1997.44
HARVEST (field pack)						
Pick, pack, haul, cool, and sell		600 cartons @	3.50	per carton		2100.00
TOTAL OF ALL COSTS						4097.44

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

Cartons per acre	price/ 30 lb.carton (dollars)					Break-even \$/carton
	5.00	6.00	7.00	8.00	9.00	
400	-1397	-997	-597	-197	203	8.49
500	-1247	-747	-247	253	753	7.49
600	-1097	-497	103	703	1303	6.83
700	-947	-247	453	1153	1853	6.35
800	-797	3	803	1603	2403	6.00

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