U.C. COOPERATIVE EXTENSION

SAMPLE COST TO ESTABLISH AND PRODUCE

MARKET ONIONS

IMPERIAL COUNTY – 2003

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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, 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.

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

HEAVY TRACTOR WORK & LAND PREPARATION

OPERATION	$/ACRE
Plow	30.50
Subsoil, 2nd 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

	BY UNIT
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 1st time	40.00/acre
Combine bermudagrass seed 2st 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

MARKET ONION CULTURE 2002-2003

Annual acreage, yield, and value of market onions in Imperial County, CA (1997-2001)

Year	Acres	Yield/Acre*	Value/Acre
2001	4,426	878	$4,504
2000	5,526	777	$3,349
1999	6,042	825	$4,333
1998	4,671	1068	$7,484
1997	4,979	908	$4,458

*50-pound sacks
Source: Imperial County Agricultural Commissioner's Reports 1997-2001

PLANTING Most of the acreage is direct seeded from early October to mid-November. Onions are grown on 40-inch beds. The number of rows varies with grower but 4 rows are normal per bed. Some plantings have been made with three seed lines on narrow beds. Seed are precision planted using Milton, Stanhay, and various air planters at a target spacing of 3½ inches between seed. Both pelleted and raw seed are used. Onions are normally not thinned. This makes seed spacing crucial for obtaining a good stand. Poor spacing will produce a high number of skips, or small/deformed onions, thus lowering packout.

Germination of onion seed is normally lower than many other vegetables. Therefore, growers should work closely with seed companies to insure that the seed meets their needs and adjust seeding rates accordingly.

Seed should be sown about ½ inch deep. In UC research plots, there was a tendency for flatter onions when seed was sown shallower. With seed deeper than ¾ inch, there was a reduction in stand and a tendency to develop deeper bulbs. While deeper bulbs are preferable, care must be taken to keep the soil moist while the bulbs are expanding or misshapen bulbs will result.

VARIETIES Onions are sensitive to day length and temperature. Only early maturing, short-day types are grown. Most of the local sweet varieties are derivatives of "grano" and "granex" types or their hybrid crosses. Bulb shape will vary and includes "flat" (flattened sphere), "deep flat", "top", or "globe" shapes. The primary use of Imperial Sweet onions is fresh cut for raw use in salads, on hamburgers, sandwiches, dips, garnishes and various marinades. They also make outstanding onion rings.

The more popular varieties include: Goldrush *Sunseeds*; Henry's Special *Sunseeds*; Timon *D. Palmer*; Monsoon *Seminis*; Colossal *Sunseeds*; Sweet Sunrise *Sunseeds*; Don Victor *Sunseeds*; Nikita *Sunseeds*; Safari *Sunseeds;* and Texas Early Grano 502 *various*.

Some onions are used for the fresh onion ring market. Varieties and selections, which have single centers and thick succulent rings, are desired for the fried onion ring trade. Multiple centers can also occur in onions exposed to a hard freeze during the winter.

Some white and red onions are grown and shipped with the yellows. White Supreme *Sunseeds*; Reina Blanca *Sunseeds*; Texas Early White (various); Kristal *Sunseeds*; and Contessa *Seminis* are white varieties.

Red Grano *various*; Mata Hari *Sunseeds*; and Rojo *Sunseeds* are commonly used red varieties.

Occasionally a grower will use transplants for production of jumbo and colossal sized onions. The decision to use transplants usually depends upon the condition of the onion crops in Texas, Mexico, and Georgia.

SOILS Medium-textured sandy loams are the most desirable soils for onion culture. Onions are shallow-rooted and need a friable soil that retains moisture well, especially after cultivation. Avoid salty, hard crusting, or weed-infested soils. Onions may be grown on sandy soils provided that moisture is made available whenever needed.

IRRIGATION Onions are generally sprinkler irrigated to emergence. It may take 10 days for the seeds to germinate, or even longer with November plantings. During this time, seeds must not be allowed to dry out and the soil surface should be moist. Onions should never suffer from lack of water. Stressing onions for water before maturity increases pungency and may cause splitting. Weather and soil conditions determine the number of irrigations required to grow a crop (usually 7-12).

FERTILIZER Generally 500 pounds of 11-52-0 ammoniated phosphate per acre are broadcast prior to listing. During the growing season 150 to 200 pounds of actual nitrogen per acre are applied. Late applications of nitrogen tend to cause re-greening and may contribute to bulb splitting.

PEST AND DISEASE CONTROL Mites, thrips, armyworms, leafminers, and maggots are the major insect pests of onions. Fields should be checked regularly for these pests.

Downy mildew (*Peronospora destructor*) and *Stemphylium* leaf spot (*Stemphylium botryosum*) are the major fungal pests of onions. These diseases can be very destructive if left unchecked. Pink root (*Pyrenochaeta terrestris*) is a soil-borne disease affecting onions; crop rotation and resistant varieties should be used to suppress the problem.

Botrytis bulb rot (*Botrytis allii*) can damage market onions. To reduce Botrytis bulb rot incidence and severity, avoid late season irrigations and heavy or late applications of nitrogen, harvest only when crop is mature, and only store after the neck tissue is well cured.

Nematodes can cause damage in onions. However, this problem rarely occurs due to the late-fall planting period.

Hand weeding is often very destructive to the onion stand. Herbicide use is essential to maximize onion yields. Follow the label directions closely to achieve the best weed control and to reduce crop injury.

HARVESTING As a rule, harvesting takes place from late March through May depending upon weather. Onion tops begin to bend at the neck and fall over as the bulbs mature. Careful evaluation must be made for the last irrigation. Pulling the water too soon will reduce yield; irrigating too late will cause splitting, delay maturity, and can increase the incidence of decay. Earlier crops tend to command the highest prices and often fields are harvested before prime maturity. A field is considered to be ready after 25 to 40 percent of the tops have fallen over.

Bulbs are undercut and dug with a rod weeder (counter clockwise rotating bar) and allowed to dry overnight. Crews arrive at daylight and hand-top the bulbs with clippers. The onions are sacked in burlap. The bulbs are too succulent and tender to grade and pack immediately. They are stored in the field 3 to 5 days to cure before final packing. After field curing, the sacks are then dumped into bulk trucks and hauled to sheds for sizing, re-sacking in mesh bags or cartons, loading, and shipping. The standard sizes packed include Colossal (greater than 4 inches diameter), Jumbo (3-4 inches), Medium (2-3.5 inches), Repacks (1¾-3 inches), and Boilers (less than 2 inches).

Field packing is increasingly more important. Burlap sacks of cured onions are sorted, sized, and packed on field harvest machines making a packing shed unnecessary. The most common sizes packed are Jumbo, Mediums, and Repackers. The major advantage of field packing is a lower overall cost per sack. The major disadvantage of field packing is a reduced ability to cull undesirable bulbs. Sorting belts on field-pack machines are short, making the time allowed for removing culls less than in sheds. Onions are normally transported on open, flatbed trucks to terminal markets for retail distribution.

POST HARVEST HANDLING Onions are cooled by placing pallets of sacks in the shade. Good air circulation is crucial to reduce rot. No additional cooling is used for fresh onions. The shelf life is short, usually a month to six weeks. For best storage onions should be held at 32°F and 60-65 percent relative humidity.

Black mold (*Aspergillus niger*) is a serious postharvest disease that is favored by high

temperatures and high humidity. The fungus is soilborne and may persist on crop debris from season to season. Bulbs become infected via the neck tissues as they start to mature and fall over. The main control measure is rapid curing and drying at temperatures below 86°F. These conditions seldom occur during onion harvesting in the low desert.

For more information on dry market onions, see "Fresh Market Bulb Onion Production in California", DANR Publication 7242 available from the Imperial County Cooperative Extension Office or for a free download from the Internet go to http://anrcatalog.ucdavis.edu/specials.ihtml

DRY BULB ONION 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--800 50 lb. sacks per acre

OPERATION	Cost	Materials		Hand Labor		Cost
		Type	Cost	Hours	Dollars	Per acre
LAND PREPARATION						
Stubble disc	21.00					21.00
Subsoil 2nd gear	39.00					39.00
Disc 2x	12.50					25.00
Triplane 2x	11.25					22.50
Border, cross check & break borders	19.00					19.00
Flood irrigate		Water 1 ac/ft.	16.00	1	9.25	25.25
Disc 2x	11.50					23.00
Triplane 1x	11.25					11.25
Fertilizer, spread	7.00	500 lb. 11-52-0	58.75			65.75
List 40" beds	15.00					15.00
TOTAL LAND PREPARATION						**266.75**
GROWING PERIOD						
Power mulch beds	25.00					25.00
Precision plant	17.50	Coated seed 200M	275.00			292.50
Herbicide, preplant	12.50	Dacthal	65.00			77.50
Sprinkler irrigate	185.00					185.00
Cultivate 3x	14.00					42.00
Spike 2X	9.75					19.50
Fertilize & furrow out 2x	15.00	120 lb. N @ .32	38.40			68.40
Water-run fertilizer		60 lb. N @ .32	19.20			19.20
Weed Control 2x	12.00	Buctril, Goal, Prism	21.00			45.00
Hand weed 1x				9	83.25	83.25
Irrigate 4x		Water 4.5ac/ft.	72.00	13	120.25	192.25
Insect control 2x	8.50	Insecticides	25.00			33.50
Disease control	10.00	Fungicides	49.00			59.00
TOTAL GROWING PERIOD						**1142.10**
GROWING PERIOD & LAND PREPARATION COSTS						1408.85
Land Rent (net acres)						225.00
Cash Overhead-----	13 % of preharvest costs & land rent					212.40
TOTAL PREHARVEST COSTS						**1846.25**
HARVEST COST						
Dig, top, grade, haul and sell		800 packout sacks @	3.75	per sack		3000.00
TOTAL OF ALL COSTS						**4846.25**

PROJECTED PROFIT OR LOSS PER ACRE

		Price/ 50 lb. sack (dollars)					
		4.00	5.00	6.00	7.00	8.00	**Break-even $/sack**
	700	-1671	-971	-271	429	1129	6.39
Cartons	800	-1646	-846	-46	754	1554	6.06
per	900	-1621	-721	179	1079	1979	5.80
acre	1000	-1596	-596	404	1404	2404	5.60
	1100	-1571	-471	629	1729	2829	5.43

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