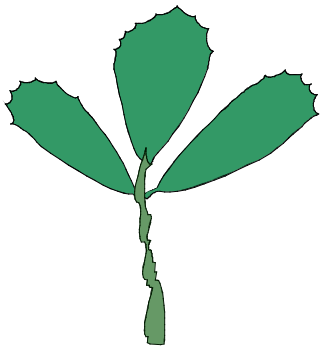
U.C. COOPERATIVE EXTENSION

SAMPLE COST TO ESTABLISH AND PRODUCE

ALFALFA HAY



HAY PRODUCTION

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.

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University of California and the United States Department of Agriculture cooperating.

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 dynamic and important vegetable industry in Imperial County.

The information presented herein allows one to get a "ballpark" idea of field crops 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. The amount of overhead charged depends upon the crop and the size of the labor crew, payroll, supplies, and supervision needed for culture.

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 loans, supervision, or return on investments. If these items were taken into account, the budget may need to be increased by 7-15%.

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2000-2001 FIELD 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

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

PLANTING, CULTIVATING & LIGHT TRACTOR WORK

Power mulch dry	23.00
Power mulch with herbicide	27.00
Shape 40" beds	9.50
Precision plant 40" beds	17.50
Plant and shape sugar beet beds	14.50
Mulch plant wheat	11.25
Plant alfalfa (corrorgated)	16.00

PLANTING, CULTIVATING & LIGHT TRACTOR WORK (continued)

OPERATION	$/ACRE
Plant bermudagrass (flat)	12.00
Plant sudangrass	10.50
Cultivate 4-row 40" beds	13.00
Spike 40" beds	9.75
Spike and furrow 4-rows 40-42" beds	10.25
Furrow out 40-42" beds	9.75
Lilliston 40" beds	10.75
Lilliston 40" beds with/herbicides	14.50
Inject fertilzer 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
Drill with cultipacker	15.00
Chop cotton stalks	12.00

HARVEST COSTS

	BY UNIT
Combine alfalfa seed	40.00/acre
Windrow alfalfa seed	15.00/acre
Rake bermudagrass (heavy)	7.00/acre
Rake bermudagrass (light)	4.00/acre
Swath bermudagrass (heavy)	15.00/acre
Swath bermudagrass (light)	10.00/acre
Swath sudangrass	10.00/acre
Rake sudangrass	5.00/acre
Crimp sudangrass	8.00/acre
Swath alfalfa	7.75/acre
Rake alfalfa	3.75/acre
Bale (all types of hay)	0.63/bale
Haul & stack hay	0.24/bale
Dig sugar beets	2.50/clean ton
Haul sugar beets	2.45/clean ton
Combine wheat	15/ton + 0.55/cwtover 1 ton
Haul wheat	5/ton

IRRIGATION

Sprinkler irrigate flat crops	$125-160.00/acre
Flood irrigate flat crops	variable
Irrigate bed-planted crops	variable
1ac-ft water	14.56

IMPERIAL COUNTY ALFALFA CULTURE 2000-2001

Annual acreage, yields, and value of alfalfa in Imperial County, CA for five consecutive years

Year	Acres	Yield/Acre (tons)	Value/Acre
1999	172,771	8.04	$687
1998	178,517	7.65	$716
1997	165,922	7.56	$891
1996	158,926	7.54	$769
1995	175,901	7.94	$695

(Source: I.C. Agricultural Commissioner's Reports). Does not include cubed or green chopped.

SOIL PREPARATION A uniform seedbed is prerequisite to a good stand. High and low spots in the field cause uneven irrigation, resulting in poor stands. A well-drained field is necessary to prevent problems with salinity, scald, and root rot. Many growers plow while others prefer to subsoil during preplant soil preparation. These operations improve drainage.

Planting alfalfa on 40-inch beds on heavy soils is now common practice where poor drainage is a problem.

Laser leveling is helpful to reduce summer scald and allow for more uniform irrigation. The price of laser leveling is $85 per hour, which normally works out to be $40-45 per acre for light leveling up to $300 per acre for extensive leveling. Prices vary according to how many machines are working in the field and how much soil has to be moved.

PLANTING RATES One pound of seed per acre will provide 4-5 seeds per square foot. At a seeding rate of 25 pounds per acre, 100-125 seeds per square foot are sown. Growers plant 15-30 pounds of seed depending on the condition of their field, cost of seed, method of planting and time of planting. The same amount of seed is used for alfalfa planted on 40-inch beds. There are 4-6 seed lines on bed-planted alfalfa. A rough-textured seedbed is preferred to a fine-textured seedbed. A fine-textured, powdery seedbed will crust over reducing seedling emergence.

Planting may be by broadcasting seed and rolling the soil with a ring roller, or planted with a Brillion-type seeder. The seed should be planted ¼-½ inch deep. Planting deeper may reduce seedling emergence. Some precision planting is done with bed culture.

PLANTING DATES Late September through November is the preferred time for planting. December plantings often result in poor germination and heavy weed infestation. Spring plantings are occasionally made in February and March. Alfalfa plantings normally stay in production 3 to 5 years.

VARIETIES "CUF 101" is the most popular variety grown. Other commercial varieties used include "Moapa","Cibola", "Mecca" and "La Jolla". Varieties that have resistance to the spotted alfalfa aphid, and the blue alfalfa aphid should be used. Yields vary depending upon the variety and soil type. Consult your seed dealer for the best variety selections.

FERTILIZATION Approximately 100 pounds of phosphate (P_2O_5) is removed from the soil for every 7-8 tons of alfalfa hay produced. This amount of phosphate 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. Additional annual applications of 100 pounds of phosphate are recommended during the winter.

On soils low in nitrogen, the application of 20-30 pounds of actual nitrogen will stimulate seedling growth. A nitrogen deficiency may occur on virgin soils recently brought into production. In rare cases, it may be necessary to apply a bacterial inoculum (*Rhizobium meliloti*) to speed up the process of fixing atmospheric nitrogen.

IRRIGATION One or two irrigations may be needed to establish at stand, depending upon soil type. Some growers use sprinklers for alfalfa stand establishment. If sprinklers are used, the normal custom rate is $125-150 per acre.

One to three irrigations per cutting are necessary depending on the soil type and time of year. During the summer, increase the flow rate down each land and irrigate fewer lands to prevent scalding, a condition causing death of plants by suffocating the roots when temperatures exceed 104°F. No more than 4-6 hours should be required to run the water in each land. Normally growers cut off the irrigation water when it is about 80 percent of the way down the length of the field.

Additional monetary charges are included in the irrigation budget to account for grading ditches, bucking ends of borders after listing (bed planting), and other miscellaneous operations.

PEST CONTROL The spotted alfalfa aphid can cause damage to nonresistant alfalfa. Control is often necessary for the Egyptian alfalfa weevil, the pea aphid and the blue alfalfa aphid. These pests are most active in February and March. Leafhoppers may damage alfalfa from April through September. Alfalfa caterpillar and beet armyworm usually require control in mid to late summer. Occasionally, cutworm outbreaks occur in fall and spring months. Alfalfa planted on beds is more susceptible to cutworm damage than flat-planted alfalfa.

Root rot caused by *Phytophthora* spp. can be a severe problem. Stem canker (*Rhizoctonia solani*) and anthracnose (*Colletotrichum trifolii*) can be severe problems as well.

WEED CONTROL Weeds during stand establishment normally do not cause problems with long-term crop yield. Weeds add to total animal forage for the first pasturing, but often cause some yield reduction at the second harvest (compared to herbicide-treated fields). By the third cutting of a new stand, most weeds no longer have an effect on crop yield. However, weeds such as wild oats, canarygrass, and creeping wartcress can cause stand loss and consequent yield loss in new fields. Several herbicides are available for weed control in seedling alfalfa. Consult your pest control advisor or Weed Science Farm Advisor for the latest recommendations.

Summer annual grasses are a common problem in established alfalfa. Grasses invade areas where there has been alfalfa stand loss caused by root diseases or scald. Herbicides are available to prevent or control these grasses.

HARVESTING Alfalfa is normally baled from March through October. Some limited baling is done year round. During winter months, both sheep pasturing and green chopping are normally practiced. Both pasturing and green chopping may return from $55-$85 per acre for the winter months. The value depends upon weed growth and weather conditions.

Maximum yield and high quality hay are seldom attainable at the same time. Hay quality decreases with increasing yield. A good compromise is to cut fields at roughly 10% bloom. Hay cut during the late afternoon or early evening produces higher quality than hay cut in the early morning. Hay should be baled with moisture content of 10-15%. Less moisture causes loss of leaves, thereby decreasing quality. Hay baled with more moisture may mold or overheat in the stack.

Prices charged for cutting, raking, baling and hauling vary with location. Driving distances are often greater for fields located in the northern part of Imperial Valley, resulting in higher costs.

IMPERIAL COUNTY PROJECTED ALFALFA HAY PRODUCTION COSTS 2000-2001

Mechanical operations at prevailing rates. Hand labor at $7.75/hr ($5.75 plus SS, unemployment and fringe benefits).

8 tons per average

	Prevailing	MATERIALS		HAND LABOR		COST
OPERATION	**Rate**	**Type /Amount**	**Cost**	**Hours**	**Dollars**	**Per Acre**
LAND PREPARATION						
Subsoil	38.75					38.75
Disc 2x	11.50					23.00
Fertilize	8.00	250 lb 11-52-0	31.88			39.88
Border, cross check & break borders	17.75					17.75
Flood		1/2 ac-ft	7.28	1	7.75	15.03
Disc 2x	11.50					23.00
Landplane 2x	12.00					24.00
Border, dump	14.00					14.00
Float	10.00					10.00
TOTAL LAND PREPARATION COSTS						**205.41**
COST OF ESTABLISHMENT						
Planting	10.50	25lb seed @ 1.70	42.50			53.00
Irrigate 2x		1 ac-ft	14.56	2	15.50	30.06
Weed control 1x	7.50	Herbicide	35.00			42.50
Insect control 1x	8.00	Insecticide	10.00			18.00
COST OF ESTABLISHMENT						**143.56**
TOTAL COST OF STAND ESTABLISHMENT						**348.97**
ANNUAL COST OF HAY PRODUCTION (3-4 year life)						
Weed control 2x	7.50	Herbicide	28.00			43.00
Irrigate 16x		6.5 ac-ft	94.64	9	69.75	164.39
Fertilize	6.00	100 lb P2O5 @ 0.26	26.00			32.00
Insect control 4x	8.00	Insecticide	50.00			82.00
TOTAL ANNUAL CULTURAL COSTS						**321.39**
Land rent (net acres)						190.00
Amortization--	33 % of total cost of stand establishment					115.16
Cash overhead--	13 % of annual costs, land rent and amortization					81.45
TOTAL PREHARVEST COSTS						**708.00**
HARVEST COSTS						
Swather 7x	7.75					54.25
Rake 12x	3.75					45.00
Bale	0.63 /bale	128 bales (8 tons)				80.64
Haul & stack	0.24 /bale	128 bales (8 tons)				30.72
TOTAL HARVEST COSTS						**210.61**
TOTAL ALL COSTS						**918.61**

PROJECTED NET GAIN (PER ACRE)

Yield	Price/ton ($)							Breakeven
(tons/a)	**70**	**80**	**90**	**100**	**110**	**120**	**130**	**($/ton)**
7	-415	-345	-275	-205	-135	-65	5	129
8	-359	-279	-199	-119	-39	41	121	115
9	-303	-213	-123	-33	57	147	237	104
10	-246	-146	-46	54	154	254	354	95
11	-190	-80	30	140	250	360	470	87