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UNIVERSITY OF CALIFORNIA - COOPERATIVE EXTENSION

SAMPLE COSTS TO PRODUCE

Beans



COMMON DRY VARIETIES – SINGLE-CROPPED In the SACRAMENTO VALLEY

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INTRODUCTION

Sample costs to produce single-cropped common dry beans in the Sacramento Valley are presented in this study. The hypothetical farm used in this report is 1,500 acres producing 100 acres of dry beans, including Lima (large and small) and blackeye (vine and bush) beans. This study is intended as a guide only, and can be used to make production decisions, determine potential returns, prepare budgets and evaluate production loans. Practices described are based on those production procedures considered typical for this crop and area, but will not apply to every situation. Sample costs for labor, materials, equipment, and custom services are based on current figures. Some costs and practices presented in this study may not be applicable to your situation. A blank column, “*Your Costs*”, is provided in Table 1 to enter your costs.

The hypothetical farm operation, production practices, overhead, and calculations are described under the assumptions. For additional information or an explanation of the calculations used in the study call the Department of Agricultural and Resource Economics, University of California, Davis, 530-752-2414.

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Sample Cost of Production studies for many commodities are available and can be requested through the Department of Agricultural and Resource Economics, UC Davis, 530-752-4424. Current studies, those produced during the last five years, can be obtained from selected county UC Cooperative Extension offices or downloaded from the department website <http://coststudies.ucdavis.edu>.

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ASSUMPTIONS

The following are assumptions pertaining to sample costs to produce single-cropped dry beans in the Sacramento Valley. Practices described are not recommendations by the University of California, but rather represent production procedures considered typical of a well managed farm for the Sacramento Valley. Costs and practices detailed in this study may not be applicable to all situations. Cultural practices for the production of dry beans vary by grower and region, which can be significant. The practices and inputs used in this cost study serve only as a sample or guide. These costs are represented on an annual, per acre basis. *The use of trade names in this report does not constitute an endorsement or recommendation by the University of California nor is any criticism implied by omission of other similar products.*

CULTURAL PRACTICES AND MATERIAL INPUTS

Land and Share Rent. This report is based on a 1,500 acre field and row crop farm of which 100 acres are producing dry beans. Rotational crops that might be planted on the remaining 1,400 acres include alfalfa hay, corn, safflower, sunflower, seed crops, processing tomatoes, and wheat.

Land in this study is leased on a share-rent basis with the land owner receiving 19% of the gross returns from the dry beans. Based on the yield and price assumed in this study land rent is \$147.25 per acre. The land rented includes developed wells and irrigation system. The grower owns a shop and an equipment yard to repair and store equipment.

Labor. Basic hourly wages for workers are \$9.87 and \$6.81 per hour for machine operators and non-machine (irrigators) workers, respectively. Adding 45% for SDI, FICA, insurance and other benefits raises the total labor costs to \$14.31 per hour for machine operators and \$9.87 per hour for non-machine labor. The labor for operations involving machinery are 20% higher than the operation time to account for the additional time involved in equipment set up, moving, maintenance and repair. Any returns above total costs are considered returns to investment.

Land Preparation. Land leveling occurs every eighth year during October in preparation for another crop. The field is laser leveled to maintain irrigation efficiency. The cost of one eighth of the leveling is assigned to the dry bean crop. After leveling, the ground is disced twice with a finishing disc prior to listing the beds. In this study, six rows of beds are listed per pass 30 inches apart in October. Growers in this region also use three beds 60 inches wide for planting. All operations are done on 100% of the acres unless otherwise noted.

Stand Establishment. In April, a preplant herbicide is sprayed and incorporated into the soil. Dry beans are seeded in May with a starter fertilizer and seeding is usually completed by the end of May. Dry beans are planted at 75 pounds per acre with a cost of \$0.50 per pound. Seeds are planted into moisture and begin to emerge in five to seven days depending on soil temperature. There are several different bean varieties single-cropped in the Sacramento Valley including Lima (large and small) and blackeye (vine and bush) beans.

Fertilization. A starter fertilizer of 8-24-6 is applied at planting at 20 gallons per acre. Later in the season aqua ammonia is sidedressed (injected) at 80 pounds of nitrogen per acre. Cultivation for weed control also occurs during the sidedress operation.

Irrigation. Dry beans are furrow irrigated with one preplant and six irrigations during the season. A total of 30 acre-inches of water is applied for a single crop.

Weed Management. Both chemical and cultural practices are used for weed control in this study. During the winter a fallow herbicide is used to control weeds. Weeds are also controlled during the first cultivation (only 50% of the acreage prior to planting) and again when fields are sidedressed with aqua ammonia in June.

Insect and Disease Management. The two major pests of dry beans are spider mites and *Lygus* bugs. In some years corn ear worms and army worms are serious pests damaging developing pods.

Spider mites are treated in July with Kelthane plus Dimethoate for lygus control during the bloom period. A second treatment for lygus, worms, and aphids is made in August using Warrior. The mite/lygus treatment is applied by ground sprayer and the second insecticide application is made by air.

Disease damage is caused by rhizoctonia and pythium root rot and prevented through seed treatment chemicals and good cultural practices. The seed treatment chemicals are included in the price of the seed.

The pesticides and rates, and cultural practices mentioned in this cost study are a few of those that are listed in the “*UC IPM Pest Management Guidelines, Dry Beans*” and located on the internet at <http://www.ipm.ucdavis.edu/PMG/selectnewpest.beans.html>. Written recommendations are required for many pesticides and are made by licensed pest control advisors. For information and pesticide use permits, contact the local county Agricultural Commissioner's office.

Harvest. Once the beans are mature they are cut below ground level with a set of tractor-mounted knives. Six to eight rows are cut in one pass and left to dry on top of the beds. One or two days later, depending on bean moisture, the cut beans are raked into windrows. Each windrow consists of six to eight rows combined into one row. If windrowed beans are rained on, additional rakings may be used to turn and dry the lower portion of the windrow. Beans are ready for harvest when they reach approximately 12% moisture.

Beans are cut and raked by the grower. Threshing the beans is done by a custom operator at a rate of \$2.50 per hundredweight (cwt) based on the weight in the field. Postharvest bean costs include cleaning, bagging, storage, and insurance at the warehouse for a charge of \$3.75 per cwt.

Growers may choose to own harvesting equipment, purchase either new or used, or hire a custom harvester to perform the harvest. Many factors are important in deciding which harvesting option a grower uses. These considerations and appropriate method of analysis are discussed in “*Acquiring alfalfa hay harvest equipment: A financial analysis of alternatives*”.

Assessments. Dry bean growers pay a fee to the Dry Bean Advisory Board based on yields. The assessment has two components. First, is a basic fee of \$0.18 per cwt for any variety of bean produced. The second assessment ranges from \$0.01 to \$0.08 per cwt depending on the variety grown. A combined assessment of \$0.22 per cwt is used in this study.

Yields. The crop yield used in this study is 25.0 cwt per acre at 12% moisture. The yield is after cleaning at the warehouse. Sutter County was the only county that separates blackeye and Lima from unspecified bean varieties in the annual crop reports for the Sacramento Valley. Acreage of harvested beans in Sutter County for the last five years averaged 794 acres of blackeye and 3,593 acres of baby Lima. The reported blackeye and baby Lima bean yields and prices from 1999 through 2003 are shown in Table A.

Table A. Blackeye and baby Lima bean yields and prices for Sutter County[§]

Year	Yields		Price	
	Blackeye	Baby Lima	Blackeye	Baby Lima
	Cwt/Acre		\$/Cwt	
1999	15.2	20.6	22.90	27.35
2000	19.4	17.6	24.55	25.50
2001	18.0	18.4	26.60	29.75
2002	15.2	24.6	29.78	30.00
2003	27.2	18.0	28.89	30.21
Average	19.0	20.2	26.54	28.56

[§] Data from Sutter County Crop Reports, 1999-2003.

Returns. Due to the different varieties of beans grown in the Sacramento Valley, prices will vary. A selling price of a \$31 per cwt is used to estimate income from the sale of these beans. Prices for blackeye and baby Lima bean varieties for the past five years are shown in Table A.

Risk. Risks associated with dry bean production are not assigned a production cost. While this study makes an effort to model a production system based on typical, real world practices, it cannot fully represent financial, agronomic and market risks which affect the profitability and economic viability of dry bean production. Though, not used in this study, crop insurance is a risk management tool available to growers.

CASH OVERHEAD COSTS

Cash Overhead. Cash overhead consists of various cash expenses paid out during the year that are assigned to the whole farm and not to a particular operation. These costs include property taxes, interest on operating capital, office expense, liability and property insurance, and investment repairs.

Equipment Cash Costs. Equipment costs are composed of three parts; capital recovery, cash overhead, and operating costs. The operating costs consist of fuel, lubrication, and repairs.

Repair costs are based on purchase price, annual hours of use, total hours of life, and repair coefficients formulated by the American Society of Agricultural Engineers (ASAE). Fuel and lubrication costs are also determined by ASAE equations based on maximum PTO horsepower (hp) and type of fuel used. The fuel and repair cost per acre for each operation in Table 2 is determined by multiplying the total hourly operating cost in Table 5 for each piece of equipment used for the cultural practice by the number of hours per acre for that operation. Tractor time is 10% higher than implement time for a given operation to account for setup time. Prices for on-farm delivery of diesel and gasoline are \$1.45 and \$1.88 per gallon, respectively.

Property Taxes. Counties charge a base property tax rate of 1% on the assessed value of the property. In some counties special assessment districts exist and charge additional taxes on property including equipment, buildings, and improvements. For this study, county taxes are calculated as 1% of the

average value of the property. Average value equals new cost plus salvage value divided by 2 on a per acre basis.

Interest On Operating Capital. Interest on operating capital is based on cash operating costs and is calculated monthly until harvest at a nominal rate of 6.89% per year. A nominal interest rate is the going market cost of borrowed funds.

Insurance. Insurance for farm investments vary depending on the assets included and the amount of coverage. Property insurance provides coverage for property loss and is charged at 0.676% of the average value of the assets over their useful life. Liability insurance covers accidents on the farm and costs \$1,122 for the entire farm or \$0.75 per acre.

Office Expense: Office and business expenses are estimated at \$10 per acre. These expenses include office supplies, telephones, bookkeeping, accounting, legal fees, road maintenance, etc. Cash overhead costs are found in Tables 1, 2, 3 and 4.

NON-CASH OVERHEAD COSTS

Capital Recovery Costs. Non-cash overhead is calculated as the capital recovery cost for equipment and other farm investments. Although farm equipment on farms in the Sacramento Valley might be purchased new or used, this study shows the current purchase price for new equipment. The new purchase price is adjusted to 60% to indicate a mix of new and used equipment. Annual ownership costs (Equipment and Investments) are shown in Tables 1-3, and 5. They represent the capital recovery cost for investments on an annual per acre basis.

Capital Recovery Costs. Capital recovery cost is the annual depreciation and interest costs for a capital investment. It is the amount of money required each year to recover the difference between the purchase price and salvage value (unrecovered capital). Put another way, it is equivalent to the annual payment on a loan for the investment with the down payment equal to the discounted salvage value. This is a more complex method of calculating ownership costs than straight-line depreciation and opportunity costs, but more accurately represents the annual costs of ownership because it takes the time value of money into account (Boehlje and Eidman). The calculation for the annual capital recovery costs is as follows.

$$\left[\left(\frac{\text{Purchase Price} - \text{Salvage Value}}{\text{Price Value}} \right) \times \left(\frac{\text{Capital Recovery}}{\text{Factor}} \right) \right] + \left[\frac{\text{Salvage Value} \times \text{Interest Rate}}{\text{Value Rate}} \right]$$

Salvage Value. Salvage value is an estimate of the remaining value of an investment at the end of its life. For farm machinery (e.g., tractors and implements) the remaining value is a percentage of the new cost of the investment (Boehlje and Eidman). The life in years is estimated by dividing the wear-out life, as given by ASAE by the annual use in hours. Salvage value is calculated as

$$\text{New Price} \times \% \text{ Remaining Value}$$

Salvage value for other investments including irrigation systems, buildings, and miscellaneous equipment is zero. The salvage value for land is equal to the purchase price because land does not depreciate. Salvage value for investments can vary. The purchase price and salvage value for certain equipment and investments are shown in Table 4.

Capital Recovery Factor. Capital recovery factor is the amortization factor or annual payment whose present value at compound interest is 1. It is the function of the interest rate and years of life of the equipment or investment.

Interest Rate. The interest rate of 6.23% used to calculate capital recovery cost is the United States Department of Agriculture-Economic Reporting Service's (USDA-ERS) ten year average of California's agricultural sector long-run real rate of return to production assets from current income. It is used to reflect the long-term realized rate of return to these specialized resources that can only be used effectively in the agricultural sector, not including inflation. In other words, the next best alternative use for these resources is in another agricultural enterprise.

Acknowledgment. Appreciation is expressed to Colusa Produce Corporation and other cooperators who provided support and information for this study.

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For information concerning the above or other University of California publications, contact UC DANR Communications Services at 1-800-994-8849, online at www.ucop.edu, or your local county UC Cooperative Extension office.

Table 1

U.C. COOPERATIVE EXTENSION
 COSTS PER ACRE TO PRODUCE SINGLE-CROPPED DRY BEANS
 SACRAMENTO VALLEY – 2004

Labor Rate: \$14.31/hr. machine labor
 \$9.87/hr. non-machine labor

Interest Rate: 6.89%
 Yield per Acre: 25.0 Cwt

Operation	Operation Time (Hrs/A)	----- Cash and Labor Costs per Acre -----					Total Cost	Your Cost
		Labor Cost	Fuel, Lube & Repairs	Material Cost	Custom/ Rent			
Cultural:								
Laser Level (1 In 8 Years)	0.00	0	0	0	10	10		
Finish Disc 2X	0.40	7	12	0	0	19		
List Beds	0.15	3	2	0	0	4		
Weed Control - Fallow Herbicide	0.07	1	0	14	0	15		
Make Drains 4X	0.20	4	5	0	0	9		
Pre-Irrigate 50% of Acreage	1.20	12	0	4	0	15		
Close Drains 4X	0.11	2	1	0	0	3		
Weed Control - Preplant Herbicide	0.20	3	2	25	0	31		
Plant Beans & Apply Fertilizer	0.25	9	4	65	0	79		
Irrigate 6X	7.20	71	0	49	0	120		
Cultivate & Sidedress Fertilizer	0.20	3	3	28	0	34		
Insect Control - Mites/Lygus	0.33	6	4	24	0	34		
Insect Control - Lygus/Worm/Aphids	0.00	0	0	12	10	21		
Pickup Truck Use	0.19	7	3	0	0	9		
ATV Use	0.19	3	0	0	0	4		
TOTAL CULTURAL COSTS	10.69	130	37	221	19	408		
Harvest:								
Cut & Rake Beans	0.25	4	3	0	0	7		
Thresh Beans - Custom	0.00	0	0	0	63	63		
Haul Beans To Warehouse	0.00	0	0	0	13	13		
Clean, Bag, Store & Insurance	0.00	0	0	0	94	94		
Dry Bean Advisory Board Assessment	0.00	0	0	6	0	6		
TOTAL HARVEST COSTS	0.25	4	3	6	169	182		
Interest on operating capital @ 6.89%						10		
TOTAL OPERATING COSTS/ACRE		135	40	227	188	600		
CASH OVERHEAD:								
Liability Insurance						1		
Office Expense						10		
Share Rent @ 19% of Gross Returns						147		
Property Taxes						2		
Property Insurance						1		
Investment Repairs						1		
TOTAL CASH OVERHEAD COSTS						162		
TOTAL CASH COSTS/ACRE						762		
NON-CASH OVERHEAD:								
		Per producing		-- Annual Cost --				
Investment		<u>Acres</u>		<u>Capital Recovery</u>				
Shop Building		46		4		4		
Fuel Tanks & Pumps		11		1		1		
Shop Tools		9		1		1		
Fuel Wagon		1		0		0		
Tool Carrier		10		1		1		
Siphon Tubes		2		0		0		
Equipment		212		25		25		
TOTAL NON-CASH OVERHEAD COSTS		291		32		32		
TOTAL COSTS/ACRE						794		

Table 2.

U.C. COOPERATIVE EXTENSION
 COSTS AND RETURNS PER ACRE TO PRODUCE SINGLE-CROPPED DRY BEANS
 SACRAMENTO VALLEY - 2004

Labor Rate: \$14.31/hr. machine labor
 \$9.87/hr. non-machine labor

Interest Rate: 6.89%

	Quantity/Acre	Unit	Price or Cost/Unit	Value or Cost/Acre	Your Cost
GROSS RETURNS					
SINGLE-CROPPED DRY BEANS	25.0	CWT	31.00	<u>775</u>	
TOTAL GROSS RETURNS FOR SINGLE-CROPPED DRY BEANS				<u>775</u>	
OPERATING COSTS					
Custom:					
Laser Level	0.13	Acre	75.00	10	
Air Application	1.00	Acre	9.50	10	
Thresh Beans	25.00	Cwt	2.50	63	
Haul Beans	25.00	Cwt	0.50	13	
Clean, Bag, Store & Insure	25.00	Cwt	3.75	94	
Herbicide:					
Roundup Ultra Max	26.00	FlOz	0.54	14	
Dual Magnum	1.00	Pint	18.32	18	
Treflan HFP	1.50	Pint	4.74	7	
Irrigation:					
Water	30.00	AcIn	1.76	53	
Seed:					
Dry Bean Seed	75.00	Lb	0.50	38	
Fertilizer:					
8-24-6	20.00	Gal	1.39	28	
20-0-0	80.00	Lb N	0.35	28	
Miticide:					
Kelthane MF	2.00	Pint	8.81	18	
Insecticide:					
Dimethoate 4EC	1.00	Pint	6.23	6	
Warrior T	3.84	Oz	3.02	12	
Assessment:					
Dry Bean Advisory	25.00	Cwt	0.22	6	
Labor (machine)	3.28	Hrs	14.31	47	
Labor (non-machine)	8.90	Hrs	9.87	88	
Fuel - Gas	1.30	Gal	1.88	2	
Fuel - Diesel	14.95	Gal	1.45	22	
Lube				4	
Machinery repair				13	
Interest on operating capital @ 6.89%				<u>10</u>	
TOTAL OPERATING COSTS/ACRE				<u>600</u>	
NET RETURNS ABOVE OPERATING COSTS				<u>175</u>	
CASH OVERHEAD COSTS:					
Liability Insurance				1	
Office Expense				10	
Share Rent @ 19% of Gross Returns				147	
Property Taxes				2	
Property Insurance				1	
Investment Repairs				<u>1</u>	
TOTAL CASH OVERHEAD COSTS/ACRE				<u>162</u>	
TOTAL CASH COSTS/ACRE				<u>762</u>	
NON-CASH OVERHEAD COSTS (CAPITAL RECOVERY):					
Shop Building				4	
Fuel Tanks & Pumps				1	
Shop Tools				1	
Fuel Wagon				0	
Tool Carrier				1	
Siphon Tubes				0	
Equipment				<u>25</u>	
TOTAL NON-CASH OVERHEAD COSTS/ACRE				<u>32</u>	
TOTAL COSTS/ACRE				<u>794</u>	
NET RETURNS ABOVE TOTAL COSTS				<u>-19</u>	

Table 3.

U.C. COOPERATIVE EXTENSION
MONTHLY CASH COSTS PER ACRE TO PRODUCE SINGLE-CROPPED DRY BEANS
SACRAMENTO VALLEY – 2004

Beginning OCT 03 Ending SEPT 04	OCT 03	NOV 03	DEC 03	JAN 04	FEB 04	MAR 04	APR 04	MAY 04	JUN 04	JUL 04	AUG 04	SEP 04	TOTAL
Cultural:													
Laser Level (1 In 8 Years)	10												10
Finish Disc 2X	19												19
List Beds	4												4
Weed Control - Fallow Herbicide					15								15
Make Drains 4X							2	2	2	2			9
Pre-Irrigate 50% of Acreage							15						15
Close Drains 4X							1		1		1		3
Weed Control - Preplant Herbicide							31						31
Plant Beans & Apply Fertilizer								79					79
Irrigate 6X								17	21	41	41		120
Cultivate & Sidedress Fertilizer									34				34
Insect Control - Mites/Lygas										34			34
Insect Control - Lygas/Worm/Aphid											21		21
Pickup Truck Use	1	1	1	1	1	1	1	1	1	1	1	1	9
ATV Use	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>4</u>
TOTAL CULTURAL COSTS	34	1	1	1	17	1	51	99	59	78	65		408
Harvest:													
Cut & Rake Beans											7		7
Thresh Beans - Custom											63		63
Haul Beans To Warehouse											13		13
Clean, Bag, Store & Insure											94		94
Dry Bean Advisory Board Assessment											<u>6</u>		<u>6</u>
TOTAL HARVEST COSTS											182		182
Interest on Operating Capital @ 6.89%	0	0	0	0	0	0	1	1	2	2	3		10
TOTAL OPERATING COSTS/ACRE	34	1	1	1	17	2	51	100	61	80	250		600
OVERHEAD:													
Liability Insurance										1			1
Office Expense	1	1	1	1	1	1	1	1	1	1	1		10
Share Rent @ 19% of Gross Returns											147		147
Property Taxes			1						1				2
Property Insurance			1						1				1
Investment Repairs	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>1</u>
TOTAL CASH OVERHEAD COSTS	1	1	2	1	1	1	1	1	2	2	148	0	162
TOTAL CASH COSTS/ACRE	35	2	4	2	18	3	52	101	63	82	398	0	762

Table 4.

U.C. COOPERATIVE EXTENSION
WHOLE FARM ANNUAL EQUIPMENT, INVESTMENT, AND BUSINESS OVERHEAD COSTS
SACRAMENTO VALLEY – 2004

ANNUAL EQUIPMENT COSTS

Yr	Description	Price	Yrs Life	Salvage Value	Capital Recovery	- Cash Overhead -		Total
						Insur- ance	Taxes	
04	200 HP Crawler Tractor	165,579	10	48,909	19,072	725	1,072	20,869
04	90 HP 2WD Tractor	62,968	10	18,600	7,253	276	408	7,936
04	ATV	4,500	5	2,017	719	22	33	773
04	Bean Knives	1,200	20	63	105	4	6	116
04	Cultivator - 6 Row	9,624	12	1,333	1,084	37	55	1,176
04	Disc - Finish 18'	23,823	10	4,213	2,956	95	140	3,191
04	Ditcher - V	4,474	15	430	449	17	25	491
04	Lister - 6 Row	1,677	12	232	189	6	10	205
04	Pickup - 1/2 Ton	21,396	5	9,589	3,418	105	155	3,678
04	Pickup - 3/4 Ton	25,840	5	11,581	4,128	126	187	4,441
04	Planter - 6 Row	16,248	10	2,873	2,016	65	96	2,176
04	Rake - 9'	5,000	10	884	620	20	29	670
04	Rear Blade - 8'	2,545	20	133	223	9	13	245
04	Saddle Tank - 300 Gallon	3,379	10	598	419	13	20	453
04	Spray Boom - 20'	482	10	85	60	2	3	65
04	Sprayer System - ATV	3,753	15	360	377	14	21	412
TOTAL		352,488		101,900	43,088	1,536	2,272	46,896
60% of New Cost *		211,493		61,140	25,853	921	1,363	28,138

* Used to reflect a mix of new and used equipment.

ANNUAL INVESTMENT COSTS

Description	Price	Yrs Life	Salvage Value	Capital Recovery	----- Cash Overhead -----			Total
					Insur- ance	Taxes	Repairs	
INVESTMENT								
Fuel Tanks	16,859	20	1,686	1,453	63	93	227	1,835
Fuel Wagon	2,045	10	205	265	8	11	40	324
Shop Building	68,327	25	6,833	5,342	254	376	922	6,894
Shop Tools	13,072	20	1,307	1,126	49	72	131	1,378
Siphon Tubes	3,690	20	369	318	14	20	92	444
Tool Carrier	15,118	15	1,512	1,516	56	83	350	2,006
TOTAL INVESTMENT	119,111		11,912	10,021	443	655	1,762	12,881

ANNUAL BUSINESS OVERHEAD COSTS

Description	Units/		Price/ Unit	Total Cost
	Farm	Unit		
Land Rent @ 19% of Gross Returns	1,500	Acre	0.83	1,245
Liability Insurance	1,500	Acre	10.00	15,000
Office Expense	100	Acre	147.25	14,725

Table 5.

U.C. COOPERATIVE EXTENSION
HOURLY EQUIPMENT COSTS
SACRAMENTO VALLEY – 2004

		----- COSTS PER HOUR -----							
		- Cash Overhead -				----- Operating -----			
Yr	Description	Actual Hours Used	Capital Recovery	Insur- ance	Taxes	Repairs	Fuel & Lube	Total Oper.	Total Costs/Hr.
04	200 HP Crawler Tractor	1,605.0	7.13	0.27	0.40	4.30	19.35	23.65	31.45
04	90 HP 2WD Tractor	1,179.8	3.69	0.14	0.21	2.86	7.37	10.23	14.27
04	ATV	285.5	1.51	0.05	0.07	0.29	2.16	2.45	4.08
04	Bean Knives	100.0	0.63	0.03	0.04	0.22	0.00	0.22	0.92
04	Cultivator - 6 Row	146.0	4.46	0.15	0.23	1.94	0.00	1.94	6.78
04	Disc - Finish 18'	200.0	8.87	0.28	0.42	3.86	0.00	3.86	13.43
04	Ditcher - V	171.0	1.58	0.06	0.09	1.41	0.00	1.41	3.13
04	Lister - 6 Row	15.5	7.32	0.25	0.37	0.34	0.00	0.34	8.28
04	Pickup - 1/2 Ton	285.0	7.20	0.22	0.33	1.39	5.40	6.79	14.53
04	Pickup - 3/4 Ton	285.0	8.69	0.27	0.39	1.67	6.49	8.16	17.51
04	Planter - 6 Row	150.0	8.06	0.26	0.38	4.36	0.00	4.36	13.07
04	Rake - 9'	250.0	1.49	0.05	0.07	0.70	0.00	0.70	2.30
04	Rear Blade - 8'	154.0	0.87	0.04	0.05	0.37	0.00	0.37	1.33
04	Saddle Tank - 300 Gallon	174.3	1.44	0.05	0.07	0.90	0.00	0.90	2.46
04	Spray Boom - 20'	169.3	0.21	0.01	0.01	0.13	0.00	0.13	0.35
04	Sprayer System - ATV	6.5	34.80	1.28	1.90	0.98	0.00	0.98	38.96

Table 6.

U.C. COOPERATIVE EXTENSION
RANGING ANALYSIS
SACRAMENTO VALLEY - 2004

COSTS PER ACRE AT VARYING YIELDS TO PRODUCE DRY BEANS							
	YIELD (CWT/ACRE)						
	10	15	20	25	30	35	40
OPERATING COSTS/ACRE:							
Cultural Cost	408	408	408	408	408	408	408
Harvest Cost	73	109	145	182	218	254	291
Interest on operating capital	9	10	10	10	10	11	11
TOTAL OPERATING COSTS/ACRE	490	527	563	600	636	673	709
TOTAL OPERATING COSTS/CWT	49	35	28	24	21	19	18
CASH OVERHEAD COSTS/ACRE	162	162	162	162	162	162	162
TOTAL CASH COSTS/ACRE	652	689	725	762	799	835	872
TOTAL CASH COSTS/CWT	65	46	36	30	27	24	22
NON-CASH OVERHEAD COSTS/ACRE	31	32	32	32	32	33	33
TOTAL COSTS/ACRE	684	720	757	794	831	868	904
TOTAL COSTS/CWT	68	48	38	32	28	25	23

NET RETURNS PER ACRE ABOVE OPERATING COSTS FOR DRY BEANS							
PRICE (DOLLARS/CWT)	YIELD (CWT/ACRE)						
	10	15	20	25	30	35	40
Dry Beans							
19	-300	-242	-183	-125	-66	-8	51
23	-260	-182	-103	-25	54	132	211
27	-220	-122	-23	75	174	272	371
31	-180	-62	57	175	294	412	531
35	-140	-2	137	275	414	552	691
39	-100	58	217	375	534	692	851
43	-60	118	297	475	654	832	1,011

NET RETURNS PER ACRE ABOVE CASH COSTS FOR DRY BEANS							
PRICE (DOLLARS/CWT)	YIELD (CWT/ACRE)						
	10	15	20	25	30	35	40
Dry Beans							
19	-462	-404	-345	-287	-229	-170	-112
23	-422	-344	-265	-187	-109	-30	48
27	-382	-284	-185	-87	11	110	208
31	-342	-224	-105	13	131	250	368
35	-302	-164	-25	113	251	390	528
39	-262	-104	55	213	371	530	688
43	-222	-44	135	313	491	670	848

NET RETURNS PER ACRE ABOVE TOTAL COSTS FOR DRY BEANS							
PRICE (DOLLARS/CWT)	YIELD (CWT/ACRE)						
	10	15	20	25	30	35	40
Dry Beans							
19	-494	-435	-377	-319	-261	-203	-144
23	-454	-375	-297	-219	-141	-63	16
27	-414	-315	-217	-119	-21	77	176
31	-374	-255	-137	-19	99	217	336
35	-334	-195	-57	81	219	357	496
39	-294	-135	23	181	339	497	656
43	-254	-75	103	281	459	637	816

Table 7.

U.C. COOPERATIVE EXTENSION
COSTS AND RETURNS / BREAKEVEN ANALYSIS
SACRAMENTO VALLEY – 2004

COSTS AND RETURNS - PER ACRE BASIS							
Crop	1. Gross Returns	2. Operating Costs	3. Net Returns Above Oper. Costs (1-2)	4. Cash Costs	5. Net Returns Above Cash Costs (1-4)	6. Total Costs	7. Net Returns Above Total Costs (1-6)
Dry Beans	775	600	175	762	13	794	-19

COSTS AND RETURNS - TOTAL ACREAGE							
Crop	1. Gross Returns	2. Operating Costs	3. Net Returns Above Oper. Costs (1-2)	4. Cash Costs	5. Net Returns Above Cash Costs (1-4)	6. Total Costs	7. Net Returns Above Total Costs (1-6)
Dry Beans	77,500	59,985	17,515	76,203	1,297	79,408	-1,908

BREAKEVEN PRICES PER YIELD UNIT					
CROP	Base Yield (Units/Acre)	Yield Units	Operating Costs	Cash Costs	Total Costs
Dry Beans	25.0	Cwt	23.99	30.48	31.76

BREAKEVEN YIELDS PER ACRE					
CROP	Yield Units	Base Price (\$/Unit)	Operating Costs	Cash Costs	Total Costs
Dry Beans	Cwt	31.00	19.3	24.6	25.6

Table 9.

UC COOPERATIVE EXTENSION
OPERATIONS BY MONTH
SACRAMENTO VALLEY - 2004

Operation	Operation Month	Tractor/ Power Unit	Implement	Material	Broadcast Rate/acre	Material Unit
Cultural:						
Laser Level (1 in 8 Years)	October	200 HP Crawler	Triplane - 16'			
Finish Disc 2X	October	200 HP Crawler	Disc - Finish 25'			
List Beds	October	90 HP 2WD Tractor	Lister - 6 Row			
Weed Control - Fallow Herbicide	February	ATV	Sprayer System - ATV	Roundup Ultra	26.00	Fl Oz
Cultivate 50% of Acreage	April	90 HP 2WD Tractor	Cultivator - 6 Row			
Make Drains 4X	April	200 HP Crawler	Ditcher - V			
	May	200 HP Crawler	Ditcher - V			
	June	200 HP Crawler	Ditcher - V			
	July	200 HP Crawler	Ditcher - V			
Pre-irrigate 50% of Acreage	April	Labor		Water	2.00	AcIn
Weed Control - Preplant Herbicide	April	90 HP 2WD Tractor	Saddle Tank - 300 Gallon	Dual Magnum	1.00	Pint
			Spray Boom - 20'	Treflan HFP	1.50	Pint
Plant Beans & Apply Fertilizer	May	90 HP 2WD Tractor	Planter - 6 Row	Dry Bean Seed	75.00	Lb
				8-24-6	20.00	Gal
Irrigate - 6X	May	Labor		Water	3.00	AcIn
	June	Labor		Water	5.00	AcIn
	July	Labor		Water	10.00	AcIn
	August	Labor		Water	10.00	AcIn
Close Ditch - 4X	June	90 HP 2WD Tractor	Rear Blade - 8'			
	June	90 HP 2WD Tractor	Rear Blade - 8'			
	June	90 HP 2WD Tractor	Rear Blade - 8'			
	August	90 HP 2WD Tractor	Rear Blade - 8'			
Cultivate & Sidedress 80 Lbs of N	June	90 HP 2WD Tractor	Cultivator - 6 Row	20-0-0	80.00	Lb N
			Saddle Tank - 300 Gallon			
Insect Control - Mites/Lygid	July	90 HP 2WD Tractor	Saddle Tank - 300 Gallon	Kelthane MF	2.00	Pint
			Spray Boom - 20'	Dimethoate 4EC	1.00	Pint
Insect Control - Lygid/Worm/Aphid	August			Warrior T	2.00	Pint
				Air Application		
Cut & Rake Beans	August	90 HP 2WD Tractor	Bean Knives			
			Rake - 9'			
Thresh Beans	August			Custom		
Haul Beans to Warehouse	August			Hauling		
Clean, Bag, Store, & Insure	August			Custom		
Pickup Truck Use	Annual	Pickup - 1/2 Ton				
		Pickup - 3/4 Ton				
ATV	Annual	ATV				