

1999
U.C. COOPERATIVE EXTENSION
SAMPLE COSTS TO PRODUCE
~ *COTTON* ~



30-INCH ROW Acala VARIETY
SAN JOAQUIN VALLEY

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INTRODUCTION

The detailed costs for acala cotton production in the San Joaquin Valley are presented in this study. The hypothetical farm used in this report consists of 1,200 acres with 800 acres planted to cotton.

Practices described in this study are based on those production procedures considered typical for well managed field and row crop farms in this area. Additional practices that are not listed may be required. Sample costs given for labor, materials, equipment and contract services are based on current figures. Some costs and practices detailed in this study may not be applicable to every situation. **This study is only intended as a guide and can be used in making production decisions, determining potential returns, preparing budgets and evaluating production loans.** A blank, *Your Cost*, column is provided to enter your actual costs on Table 2, Sample Costs To Produce Cotton and Table 3, Details of Costs Per Acre to Produce Cotton.

This study consists of General Assumptions for producing cotton and seven tables.

Table 1.	Costs Per Acre to Produce Cotton
Table 2.	Costs And Returns Per Acre to Produce Cotton
Table 3.	Monthly Cash Costs Per Acre to Produce Cotton
Table 4.	Whole Farm Annual Equipment, Investment, and Business Overhead
Table 5.	Hourly Equipment Costs
Table 6.	Ranging Analysis
Table 7.	Costs and Returns / Breakeven Analysis

For an explanation of calculations used for the study refer to the attached General Assumptions, call the Department of Agricultural and Resource Economics, Cooperative Extension, University of California, Davis, California, (530) 752-3589 or call the farm advisor in your county.

Other cost studies are available for commodities grown in the San Joaquin Valley. For those interested in this and other studies, they can be requested through the Department of Agricultural Economics, U.C. Davis, (530) 752-3589 or (530) 752-1515, or from selected county Cooperative Extension offices. There is a nominal charge.

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ASSUMPTIONS

The following is a description of some general assumptions pertaining to sample costs of 30-inch row acala cotton production in the San Joaquin Valley. Practices described should not be considered recommendations by the University of California, but rather represent production procedures considered typical for a well managed field and row crop farm in this area. Some of these costs and practices may not be applicable to your situation nor used during every production year. Additional ones not indicated may be needed. Cultural practices for the production of cotton vary by grower and region. Variations 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.*

Land. The farm consists of 1,200 acres of land. Of the total acreage, 800 acres are rented and planted to cotton. The remaining 400 acres is planted to other field and row crops. Land is rented for \$110 per acre on a cash basis. Other crops grown in rotation with cotton includes processing tomatoes, corn, wheat, alfalfa, and barley.

The 800 rented acres contains an irrigation system adequate to irrigate the total acreage. Therefore, the irrigations system cost is included as part of the land rental cost and is found in the Cash Overhead Costs sections of Tables 1, 2, and 3, and Annual Business Overhead section in Table 3.

Labor. Basic hourly wages for workers are \$8.16 per hour for machine operators and \$5.87 per hour for non-machine workers. Adding 34% for SDI, FICA, insurance and other benefits raises the total labor costs to \$10.93 per hour for machine operators and \$7.86 per hour non-machine labor. The labor for operations involving machinery is 20% higher than the operation time to account for the additional time involved in equipment set up, moving, maintenance and repair.

Row Spacing. In this study cotton is planted on 30-inch beds. Forty-inch row spacing still constitutes the majority of the cotton acreage in the San Joaquin Valley. However, 30-inch, narrow row cotton is increasingly being grown in the San Joaquin Valley and can represent an alternative to standard, 38 or 40-inch row cotton. Please see the study titled, *1999 Sample Costs To Produce Cotton, 40-Inch Row, San Joaquin Valley*, for cost and cultural practices information.

Growers wishing to change row spacing need to be aware that changes in production costs and initial capital cost outlays due to differing material rates, operation time, and acquisition of new equipment, will occur. Previous studies indicate that cash production costs for 30-inch cotton will increase about 1% above total cash production costs for 40-inch cotton.

Earlier research suggest that yields for narrow row cotton are also higher than 40-inch cotton. Based on trials, lint yields for 30-inch row cotton should increase about 7% without any increase in applied water or fertilizer. In most research, this potential 7% yield increase with 30 inch cotton has been consistently demonstrated in the northern San

Joaquin Valley. Carefully consider local experience with 30 inch cotton yields in using yield estimates and production values. Growers should carefully examine both options to determine the best system for their farm.

PRODUCTION CULTURAL PRACTICES AND MATERIAL INPUTS

Tables 1-3 show the costs associated with ground preparation, planting, growing, and harvesting cotton. Land preparations begin in fall or spring and the crop is harvested in September of the following year.

Land Preparation. Land preparation begins with subsoiling the soil profile to 2 to 3 feet in order to break up any underlying hardpan which would affect root and water penetration. The ground is then disced twice to break up large clods of soil and smooth the ground.

The discing and subsoiling operations are done with a 215 hp, crawler. All other operations involving tractors are performed with 130 or 110 hp tractors.

Planting. An upland cotton variety is seeded at a rate of 18.0 pounds per acre during April. Cotton is planted into eight, 30-inch beds.

Weed Control. A mix of materials and cultural practices are used to manage weeds in cotton. Beginning in February a pre-emergent herbicide is applied and incorporated in the fields at discing. This application will control many early season annual broadleaf and grasses. An over-the-top herbicide either for broadleaves or grasses, is sprayed in May. Mechanical cultivations also begin in May and continue until the end of June. A total of five cultivations are performed in this study, using rolling cultivators to eradicate weeds. The first cultivation is made prior to planting in March and the remaining four are done from April to June. Because of weed pressures hand hoeing is done in June. A post-directed herbicide/layby treatment is made in June for weed control up to harvest.

Irrigation. Water cost for irrigation represents a combination of district water and pumped water. Price per acre-foot for water will vary by grower depending on the particular irrigation district or various well characteristics and other irrigation factors. In this study a water cost of \$50 per acre-foot is used. Based on current information it is estimated that 2.5 acre-feet of water would be applied during the growing season for cotton in this region, though this amount is dependent upon soil and climactic factors.

Successful water management and irrigation scheduling requires careful observation of water conditions of the soil and plant. Proper irrigation management can not only strike the correct balance between vegetative growth and fruit development, but it can also influence insect and disease pests.

Fertilization. Nitrogen is the primary nutrient applied to cotton throughout the growing season. Cotton is very responsive to nitrogen, but excessive applications can cause rank or vegetative growth and lead to increased pest problems, poor defoliation, lower yields, and nitrate leaching. When cotton requires N-P-K during early growth a mixed

fertilizer, such as 4-10-10, is applied at planting, but is not used in this study. UN-32 (32-0-0) is sidedressed at a rate of 150 pounds of N per acre during the month of May. A foliar application of KNO_3 (13-0-45) is mixed with the growth regulator and sprayed in July.

Insect And Mite Management. In this study, pest management is for mites, aphids, and lygus. All pest management decisions begin with careful monitoring to determine whether insect populations have reached economically damaging populations. All insect and mite sprays are aerial applications.

Insects. Damage by lygus consists of feeding on squares and small bolls. Damaged squares will usually drop off while damaged bolls may produce stained lint and injured seeds. In this study, it is assumed that the lygus population reaches an economic threshold in June and control consists of an insecticide application.

Aphids cause physical damage to cotton leaves by their feeding and/or contamination of the lint by honeydew produced by aphids. Aphid feeding will also reduce the carbohydrates needed for boll maturation resulting in yield loss. In this study, an application of insecticides is made in July.

Cost estimates do not include applications of insect growth regulators and insecticides for silverleaf whitefly control which can be a major late-season pest in the southern San Joaquin Valley. Materials are available to aid in control, but costs are highly variable by location and timing of infestations.

Mites. Feeding by mites on leaves reduces plant vigor and can lead to extensive defoliation. Loss of energy by the plant may cause a reduction in yield. A miticide treatment in May provides control.

Growth Regulator & Defoliation. A growth regulator is applied with foliar nutrients in July. Plant growth regulators control excessive vegetative growth and promote a balance between vegetative and reproductive growth. This results in a more uniform boll set leading to a once over opening mature green bolls and mechanical harvest.

Defoliant are applied prior to picking to aid harvest by causing the leaves to drop off. Defoliation is essential for efficient mechanical picking and diminishes staining of lint by leaves while reducing the amount of trash collected with the cotton. Proper timing and rates of defoliant are essential for good yields, lint quality, and efficient harvesting. A combination of defoliant are applied once in September and again in October.

Pesticides, rates, and cultural practices mentioned in this cost study and shown in Appendix 1 are some of those listed in the *Integrated Pest Management For Cotton In The Western Region Of The United States*, *UC Pest Management Guidelines*, and *Insecticide Resistance Management in San Joaquin Valley Cotton*. All pest management strategies need to be tailored to meet specific requirements and should be discussed with a pest control advisor or local farm advisor. Written recommendations are required for many pesticides and are made by licensed pest control advisors. For information concerning pesticide use permits, contact the local county Agricultural Commissioner's office.

Equipment Cash Costs. Equipment costs are fall into three categories; capital recovery,

cash overhead, and operating costs. The cash overhead and capital recovery costs will be discussed in later sections. 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 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 6 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 (Operation Time) for a given operation to account for fueling, moving equipment, and setup time. Prices for on-farm delivery of diesel and gasoline are \$0.62 and \$1.02 per gallon, respectively.

Harvest. It is assumed that the farm in this cost study owns two cotton harvesters and a module builder which perform harvest operations. The cotton is dumped from the harvester directly into the module builder which presses loose seed cotton into a dense and economical unit for transportation to the gin. Harvest time increases for 30-inch row cotton over 40-inch row production because of there are 30% more rows per acre.

Harvesting is a crucial operation in a cotton cropping system. Growers may choose to own cotton pickers and module builders, purchased 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. The decision to invest in cotton harvesting equipment requires consideration of differences in production practices and equipment requirements for all of the crops in rotation as well as the direct cost of the harvesting equipment. These factors and appropriate method of analysis are discussed by Blank et al, (1992). Though their report specifically addresses hay harvesting the same principles and methodology can be used with cotton harvesting.

Equipment for harvest operations are inventoried in investment costs on Table 3, and labor, fuel, repairs, depreciation, and operating interest, are calculated as harvest costs in Table 1. If a grower contracts his harvest operation all harvesting equipment should be removed from investment costs in Table 3, its appropriate cost should be subtracted from harvest costs in Table 1 and a custom charge would then be added.

Transportation. Transportation costs are based on roundtrip distance from the field to the gin and module weight. This can add significant costs to producing cotton. Fields closer to the gin have lower hauling costs than those further away. For example a round-trip of 1 to 10 miles might cost \$0.30 per hundredweight (cwt) while one of 111 to 120 miles, round-trip may cost \$1.30 per cwt. Hauling companies may also have a surcharge for modules less than a minimum weight. Hauling cost are included as part of the ginning cost.

Ginning. Commercial cotton gins normally keep cottonseed and give growers a credit to cover ginning and transportation costs so most growers do not see a ginning charge. Currently, ginning costs are approximately \$3.35 per cwt. With a lint yield of 12.5 cwt per acre ginning costs in this study are \$116 per acre. In this study, ginning fees are covered by the seed credit and is not included as a line-item cost.

Cotton gins charge growers for compressing lint into bales. This is separate from ginning costs and for this study a charge of \$7.50 per bale is included in Tables 1, 2, 3, and 4.

Assessments. Cotton is assessed several fees for different organizations and purposes. Both mandatory and voluntary assessments are discussed below.

USDA-HVI. The United States Department of Agriculture (USDA) levies a fee for High Volume Instrumentation (HVI) classing. This determines the classification cotton is graded for marketing purposes. Growers are mandated with a \$1.55 per bale fee.

Cotton Incorporated. Cotton Incorporated was created by a federal marketing order and is overseen by the Cotton Board. Cotton Inc. provides funds for industry research and promotion and currently requires growers pay \$1.00 per bale plus 0.5% of the lint sale price.

Pink Bollworm Project. The California State Department of Food and Agriculture (CDFA) manages and enforces the Pink Bollworm Project. This program, which through detection and legislated postharvest practices, controls pink bollworm in the San Joaquin Valley and other cotton growing districts in the state. The Pink Bollworm Project maintains several control districts to administer the program. Under the project growers are assessed a fee only if cotton is ginned within a project district. CDFA has a current charge of \$2.00 per bale to fund the project.

National Cotton Council. The National Cotton Council, a voluntary organization, collects an assessment to provide lobbying, advocacy, and public relations for the cotton industry at the national level. The current assessment rate paid by growers is \$0.45 per bale.

California Cotton Growers And Ginners Association. The California Cotton Growers And Ginners Association assists California cotton growers in advocating their position in the legislature and charges \$0.12 per bale. Participation in this organization is voluntary.

Yields. The crop yield used in this study is based a current five year average for San Joaquin Valley cotton of 1,338 pounds of lint and 2,378 pounds of seed per acre. Returns for various lint yields, government support program, and prices are shown in Table 6.

Returns. An estimated price of a \$0.72 per pound of lint is used to calculate returns above several levels of cost. Cotton gins pay growers \$25 per bale for seed credit above grower ginning costs, if any. Table 6 indicates the effects on grower returns based on varying yields and returns. Breakeven points based on estimated costs are calculated for both yields and return prices in Table 7.

This study also includes income received from the Production Flexibility Contract (PFC) program administered by the USDA Farm Service Agency. The PFC income is calculated by taking 85% of the program payment yield and multiplying it times the payment rate. In this study the California program payment yield is 1,074 pounds of lint per acre and the payment rate is \$0.076 per pound of lint. Program support is calculated as $1,074 \text{ pounds/acre} \times 0.85 \times \$0.076/\text{pound} = \$69.38/\text{acre}$.

In this study, every cotton acre is assumed to be covered by program payments. In reality, however, maximum payment limitations may leave some acres uncovered effectively reducing the per cwt income. Maximum contract payments are limited to \$40,000 per person. However, in 1998 congress allocated additional funds for contract payments. These extra funds increase payments to individual growers by almost 50% of their 1998 PFC payment. This was a one time allocations and is not expected to be available for future years.

The PFC payment rate is set by a number of factors at harvest time. Because the actual rate is not determined until the end of each growing season the USDA sets future PFC payment rates in a range. PFC payment rates change annually. Contact the local Farm Service Agency office for further information about the support program.

Risk. The risks associated with producing and marketing field cotton should not be minimized. While this study makes every 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 cotton production. A market channel should be determined before cotton is planted and brought into production. Though, not used in this study, crop insurance is a risk management tool available to growers.

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. Cash overhead costs are included in Tables 1, 2, 3, and 4.

Property Taxes. Counties charge a base property tax at the rate of 1% on the assessed value of the property including land, equipment, buildings, and improvements. In some counties special assessment districts exist and charge additional taxes on property. 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. Land value is assumed to remain unchanged.

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 9.69% per year. This interest rate is the going market cost of borrowed funds. The cost of postharvest operations are discounted back to the harvest month using a negative interest charge.

Insurance. Insurance for farm investments varies depending on the assets included and the amount of coverage. Property insurance provides coverage for property loss and is charged at 0.713% of the average value of the assets over their useful life. Liability insurance covers accidents on the farm and costs \$1,044 for the entire farm or \$0.87 per acre.

Office Expense: Office and business expenses are estimated at \$25 per acre. These expenses include office supplies, telephones, bookkeeping, accounting, legal fees, road maintenance, etc.

Capital Recovery Costs. Non-cash overhead is calculated as the capital recovery cost for equipment and other farm investments. This study shows the current purchase price for new equipment and then adjusts the price to 60% of new cost to indicate a mix of new and used equipment. Annual ownership costs for equipment and investments are shown in Tables 1, 2, and 4 as the capital recovery cost on an annual per acre basis.

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 downpayment 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 annual capital recovery costs is as follows.

$$\left[\left(\begin{array}{c} \text{Purchase} \\ \text{Price} \end{array} - \begin{array}{c} \text{Salvage} \\ \text{Value} \end{array} \right) \times \left(\begin{array}{c} \text{Capital} \\ \text{Recovery} \\ \text{Factor} \end{array} \right) \right] + \left[\begin{array}{c} \text{Salvage} \times \text{Interest} \\ \text{Value} \quad \text{Rate} \end{array} \right]$$

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 the 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 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.

Interest Rate. The interest rate of 7.40% 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.

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Table 1.

U.C. COOPERATIVE EXTENSION
 COSTS PER ACRE TO PRODUCE COTTON
 SAN JOAQUIN VALLEY – 1999
 Acala Variety, 30-Inch Row

Labor Rate: \$10.93/hr. machine labor
 \$7.86/hr. non-machine labor

Interest Rate: 9.69%
 Yield per Acre: 1,250 Lb of Lint

Operation	Cash and Labor Costs per Acre						Your Cost
	Operation Time (Hrs/A)	Labor Cost	Fuel,Lube & Repairs	Material Cost	Custom/ Rent	Total Cost	
Cultural:							
Rip Fields	0.48	6	9	0	0	15	
Primary Discing 2X	0.29	4	6	0	0	10	
Spray & Incorporate Herbicide	0.20	3	3	8	0	14	
List Beds	0.15	2	2	0	0	4	
Make Ditch	0.06	1	1	0	0	1	
Irrigate	5.00	39	0	125	0	164	
Close Ditch	0.06	1	1	0	0	1	
Cultivate - Preplant	0.13	2	1	0	0	3	
Plant	0.25	3	3	24	0	31	
Uncap Beds	0.14	2	1	0	0	3	
Cultivate - 4X	0.52	7	5	0	0	12	
Weed Control - Over-The-Top Spray	0.29	4	3	19	0	25	
Insect Control - Mites	0.00	0	0	30	8	38	
Weed Control - Post Directed Herbicide	0.57	7	5	21	0	34	
Insect Control - Lygus	0.00	0	0	30	8	38	
Insect Control - Aphids	0.00	0	0	16	8	25	
Apply Growth Regulator & KNO ₃	0.00	0	0	13	8	21	
Fertilizer - Sidedress UN 32	0.25	3	2	33	2	40	
Defoliate Cotton 2X	0.00	0	0	46	16	62	
Advising Services	0.00	0	0	0	10	10	
Pickup Truck Use	0.24	6	1	0	0	7	
TOTAL CULTURAL COSTS	8.63	90	43	366	59	559	
Harvest:							
Harvest	0.97	13	21	0	0	34	
Build Module & Tarp	0.17	4	2	4	0	10	
Compress Cotton	0.00	0	0	0	20	20	
USDA - HVI	0.00	0	0	3	0	3	
Cotton Incorporated	0.00	0	0	7	0	7	
Cotton Pest Control Project	0.00	0	0	5	0	5	
National Cotton Council	0.00	0	0	1	0	1	
CA Cotton Growers & Ginners As	0.00	0	0	0	0	0	
TOTAL HARVEST COSTS	1.14	17	23	21	20	82	
Postharvest:							
Chop Stalks	0.13	2	2	0	0	4	
Disc Residue - 2X	0.19	2	4	0	0	6	
TOTAL POSTHARVEST COSTS	0.32	4	6	0	0	10	
Interest on operating capital @ 9.69%						29	
TOTAL OPERATING COSTS/ACRE		111	72	388	80	680	
TOTAL OPERATING COSTS/LB						0.52	
CASH OVERHEAD:							
Office Expense						25	
Liability Insurance						1	
Sanitation Facilities						3	
Land Rent						110	
Property Taxes						4	
Property Insurance						3	
Investment Repairs						1	
TOTAL CASH OVERHEAD COSTS						148	
TOTAL CASH COSTS/ACRE						827	
TOTAL CASH COSTS/LB						0.62	

U.C. COOPERATIVE EXTENSION
Table 1. continued

CAPITAL RECOVERY COSTS (7.4% Interest Rate):

	Per producing <u> Acre</u>	-- Annual Costs -- <u>Capital Recovery</u>	
Shop Buildings	67	6	6
Fuel Tanks & Pumps	2	0	0
Shop Tools	11	1	1
Fuel Wagon	15	2	2
Tool Carrier	13	1	1
Siphon Tubes	2	0	0
Equipment	<u>592</u>	<u>92</u>	<u>92</u>
TOTAL CAPITAL RECOVERY COSTS	702	103	103
TOTAL COSTS/ACRE			931
TOTAL COSTS/LB			0.70

Table 2.

U.C. COOPERATIVE EXTENSION
 COSTS AND RETURNS PER ACRE TO PRODUCE COTTON
 SAN JOAQUIN VALLEY - 1999
 Acala Variety, 30-Inch Row

Labor Rate: \$10.93/hr. machine labor
 \$7.86/hr. non-machine labor

Interest Rate: 9.69%

	Quantity/Acre	Unit	Price or Cost/Unit	Value or Cost/Acre	Your Cost
GROSS RETURNS					
Lint	1,338.00	Lb	0.72	963	
PFC	913.00	Lb	0.076	<u>69</u>	
Cottonseed	Seed credit used to pay ginning fees.				
TOTAL GROSS RETURNS					1,033
OPERATING COSTS					
Herbicide:					
Treflan Pro 5	1.50	Pint	5.36	8	
Staple	0.38	Oz	49.33	19	
Caparol	3.00	Qt	6.94	21	
Irrigation:					
Water	2.50	AcFt	50.00	125	
Seed:					
Cotton Seed	18.00	Lb	1.36	24	
Miticide:					
Zephyr	6.00	Oz	5.08	30	
Custom:					
Air Application	6.00	Acre	8.00	48	
Ginning Fee	(paid by seed credit)				
Bale Compression Fee	2.67	Bale	7.50	20	
Insecticide:					
Capture	6.00	Oz	5.08	30	
Provado	3.75	Oz	4.40	16	
Growth Regulator:					
Pix	0.50	Pint	15.42	8	
Defoliant:					
Prep	2.00	Pint	12.87	26	
Def	2.00	Pint	6.70	13	
Sodium Chloride	1.00	Gal	0.987	1	
Starfire	16.00	Oz	0.34	5	
Fertilizer:					
13-0-46	10.00	Lb	0.566	6	
UN-32	150.00	Lb N	0.22	33	
Rent:					
Fert Applicator	1.00	Acre	1.50	2	
Harvest Aid:					
Tarps - Module	0.06	Tarp	62.00	4	
Assessment:					
HVI Classing Fee	2.67	Bale	1.25	3	
Cotton Inc.	2.67	Bale	2.80	7	
Pink Bollworm Project	2.67	Bale	2.00	5	
National Cotton Council	2.67	Bale	0.45	1	
California Cotton Growers & Ginners Assoc.	2.67	Bale	0.12	0	
Contract:					
PCA/Consultant Fee	1.00	Acre	10.00	10	
Labor (machine)	6.39	Hrs	10.93	70	
Labor (non-machine)	5.26	Hrs	7.86	41	
Fuel - Gas	0.48	Gal	1.02	0	
Fuel - Diesel	46.36	Gal	0.62	29	
Lube				4	
Machinery repair				38	
Interest on operating capital @ 9.69%				<u>29</u>	
TOTAL OPERATING COSTS/ACRE					680
TOTAL OPERATING COSTS/LB					0.51
NET RETURNS ABOVE OPERATING COSTS					353

U.C. COOPERATIVE EXTENSION
Table 2. continued

CASH OVERHEAD COSTS:	
Office Expense	25
Liability Insurance	1
Sanitation Facilities	3
Land Rent	110
Property Taxes	4
Property Insurance	3
Investment Repairs	1
TOTAL CASH OVERHEAD COSTS/ACRE	148
TOTAL CASH COSTS/ACRE	827
TOTAL CASH COSTS/LB	0.62
CAPITAL RECOVERY COSTS (7.4% Interest Rate):	
Shop Buildings	6
Fuel Tanks & Pumps	0
Shop Tools	1
Fuel Wagon	2
Tool Carrier	1
Siphon Tubes	0
Equipment	92
TOTAL CAPITAL RECOVERY COSTS/ACRE	103
TOTAL COSTS/ACRE	931
TOTAL COSTS/LB	0.70
NET RETURNS ABOVE TOTAL COSTS	102

Table 3.

U.C. COOPERATIVE EXTENSION
MONTHLY CASH COSTS PER ACRE TO PRODUCE COTTON
SAN JOAQUIN VALLEY – 1999
Acala Variety, 30-Inch Row

Beginning NOV 98	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	TOTAL
Ending NOV 99	98	98	99	99	99	99	99	99	99	99	99	99	99	99
Cultural:														
Rip Fields	15													15
Primary Discing 2X	10													10
Spray & Incorporate Herbicide	14													14
List Beds	4													4
Make Ditch				0				0	0					1
Irrigate				41				30	62	31				164
Close Ditch				0				0			0			1
Cultivate - Preplant					3									3
Plant						31								31
Uncap Beds						3								3
Cultivate - 4X						3	3	6						12
Weed Control - Over-The-Top Spray							25							25
Insect Control - Mites							38							38
Weed Control - Post Directed Herbicide								34						34
Insect Control - Lygus								38						38
Insect Control - Aphids									25					25
Apply Growth Regulator & KNO ₃									21					21
Fertilizer - Sidedress UN 32									40					40
Defoliate Cotton 2X												62		62
Advising Services	1	1	1	1	1	1	1	1	1	1	1	1	1	10
Pickup Truck Use	<u>1</u>	<u>1</u>	<u>1</u>	<u>1</u>	<u>1</u>	<u>1</u>	<u>1</u>	<u>1</u>	<u>1</u>	<u>1</u>	<u>1</u>	<u>1</u>	<u>1</u>	<u>7</u>
TOTAL CULTURAL COSTS	44	1	1	44	4	38	68	111	149	32	2	63	1	559
Harvest:														
Harvest													34	34
Build Module & Tarp													10	10
Compress Cotton													20	20
USDA - HVI													3	3
Cotton Incorporated													7	7
Cotton Pest Control Project													5	5
National Cotton Council													1	1
California Cotton Growers & Ginners													<u>0</u>	<u>0</u>
TOTAL HARVEST COSTS													82	82
Postharvest:														
Chop Stalks													4	4
Disc Residue - 2X													<u>6</u>	<u>6</u>
TOTAL POSTHARVEST COSTS													10	10
Interest on oper. capital	0	0	0	1	1	1	2	3	4	4	4	5	5	29
TOTAL OPERATING COSTS/ACRE	44	2	2	44	5	39	70	113	153	36	6	67	97	680
TOTAL OPERATING COSTS/LB	0.03	0.00	0.00	0.03	0.00	0.03	0.05	0.08	0.11	0.03	0.00	0.05	0.07	0.51
OVERHEAD:														
Office Expense	2	2	2	2	2	2	2	2	2	2	2	2		25
Liability Insurance			1											1
Sanitation Facilities	0	0	0	0	0	0	0	0	0	0	0	0	0	3
Land Rent													110	110
Property Taxes			2						2					4
Property Insurance						2						2		3
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>0</u>	<u>1</u>
TOTAL CASH OVERHEAD COSTS	2	2	5	2	2	4	2	2	5	2	2	4	110	148
TOTAL CASH COSTS/ACRE	47	4	7	47	7	43	72	116	158	39	8	71	208	827
TOTAL CASH COSTS/LB	0.03	0.00	0.01	0.04	0.01	0.03	0.05	0.09	0.12	0.03	0.01	0.05	0.16	0.62

Table 4. U.C. COOPERATIVE EXTENSION
 WHOLE FARM ANNUAL EQUIPMENT, INVESTMENT, AND BUSINESS OVERHEAD COSTS
 SAN JOAQUIN VALLEY - 1999
 Cotton - Acala Variety, 30-Inch Row

ANNUAL EQUIPMENT COSTS

Yr	Description	Price	Yrs Life	Salvage Value	Capital Recovery	-- Cash Overhead --		Total
						Insur- ance	Taxes	
99	110 HP 2WD Tractor	70,050	10	20,692	8,689	324	454	9,466
99	130 HP 2WD Tractor	90,841	10	26,833	11,268	420	588	12,276
99	250 HP Crawler	176,963	10	52,272	21,951	817	1,146	23,914
99	Cultivator Rolling - 6 Row	4,676	12	648	566	19	27	612
99	Cultivator Rolling - 6 Row	4,676	12	648	566	19	27	612
99	Cultivator Rolling - 6 Row	4,676	12	648	566	19	27	612
99	Disc - Finish 21'	19,595	12	2,714	2,372	80	112	2,563
99	Disc - Stubble 18'	38,610	10	6,828	5,114	162	227	5,504
99	Disc - Tandem 24'	19,057	10	3,370	2,524	80	112	2,716
99	Ditcher	4,070	12	564	493	17	23	532
99	Flail Chopper	14,593	10	2,581	1,933	61	86	2,080
99	Harvester - 2 Row	117,700	5	40,895	21,959	565	793	23,318
99	Harvester - 2 Row	117,700	5	40,895	21,959	565	793	23,318
99	Lister - 6 Row	1,565	12	217	189	6	9	205
99	Module Builder	24,303	10	4,011	3,240	101	142	3,482
99	Pickup - 1/2 Ton	16,000	7	6,069	2,318	79	110	2,507
99	Pickup - 3/4 Ton	16,000	7	6,069	2,318	79	110	2,507
99	Planter - 6 Row	15,015	10	2,655	1,989	63	88	2,140
99	Rear Blade - 10'	2,418	10	428	320	10	14	345
99	Saddle Tank - 300 Gal	3,218	10	569	426	14	19	459
99	Spray Boom - 20'	482	10	85	64	2	3	69
99	Subsoiler - 8'	8,022	10	1,419	1,063	34	47	1,143
99	Subsoiler - 8'	8,022	10	1,419	1,063	34	47	1,143
99	Uncapper - 6 Row	5,814	10	1,028	770	24	34	829
TOTAL		784,066		223,557	113,719	3,592	5,038	122,350
60% of New Cost *		470,440		134,134	68,232	2,155	3,023	73,410

ANNUAL INVESTMENT COSTS

Yr	Description	Price	Yrs Life	Salvage Value	Capital Recovery	-----Cash Overhead -----			Total
						Insur- ance	Taxes	Repairs	
INVESTMENT									
	Fuel Tanks & Pumps	1,838	20	184	175	7	10	22	214
	Fuel Wagon	18,105	10	1,811	2,497	71	100	362	3,030
	Shop Buildings	80,991	20	8,099	7,695	318	445	891	9,349
	Shop Tools	13,568	20	1,357	1,289	53	75	149	1,566
	Siphon Tubes	2,181	20	218	207	9	12	24	252
	Tool Carrier	15,592	20	1,559	1,481	61	86	171	1,799
TOTAL INVESTMENT		132,275		13,228	13,345	519	728	1,619	16,210

ANNUAL BUSINESS OVERHEAD COSTS

Description	Units/ Farm	Unit	Price/ Unit	Total Cost
Land Rent	500	Acre	110	55,000
Liability Insurance	1,200	Acre	0.8	960
Office Expense	1,200	Acre	25	30,000
Sanitation Facilities	1,200	Acre	3.15	3,780

Table 5.

U.C. COOPERATIVE EXTENSION
 HOURLY EQUIPMENT COSTS
 SAN JOAQUIN VALLEY - 1999
 Cotton - Acala Variety, 30-Inch Row

Yr	Description	COSTS PER HOUR							Total Costs/Hr.
		Actual Hours Used	Capital Recovery	- Cash Overhead - Insur- ance	Taxes	Repairs	Operating Fuel & Lube	Total Oper.	
99	110 HP 2WD Tractor	1,670.4	3.12	0.12	0.16	3.12	4.55	7.67	11.07
99	130 HP 2WD Tractor	1,199.2	5.64	0.21	0.29	4.04	5.38	9.42	15.57
99	250 HP Crawler	1,599.2	8.24	0.31	0.43	4.50	10.34	14.84	23.81
99	Cultivator Rolling - 6 Row	166.0	2.05	0.07	0.10	0.92	0.00	0.92	3.13
99	Cultivator Rolling - 6 Row	165.5	2.05	0.07	0.10	0.92	0.00	0.92	3.14
99	Cultivator Rolling - 6 Row	166.0	2.05	0.07	0.10	0.92	0.00	0.92	3.13
99	Disc - Finish 21'	166.0	8.57	0.29	0.40	3.05	0.00	3.05	12.31
99	Disc - Stubble 18'	199.8	15.36	0.49	0.68	6.16	0.00	6.16	22.68
99	Disc - Tandem 24'	200.0	7.57	0.24	0.34	3.04	0.00	3.04	11.19
99	Ditcher	166.0	1.78	0.06	0.08	1.08	0.00	1.08	3.00
99	Flail Chopper	199.5	5.81	0.18	0.26	5.95	0.00	5.95	12.20
99	Harvester - 2 Row	267.3	49.29	1.27	1.78	12.86	6.62	19.48	71.82
99	Harvester - 2 Row	267.3	49.29	1.27	1.78	12.86	6.62	19.48	71.82
99	Lister - 6 Row	165.5	0.69	0.02	0.03	0.31	0.00	0.31	1.05
99	Module Builder	83.3	23.33	0.73	1.02	6.28	0.00	6.28	31.35
99	Pickup - 1/2 Ton	285.0	4.88	0.17	0.23	1.16	1.17	2.33	7.61
99	Pickup - 3/4 Ton	285.0	4.88	0.17	0.23	1.16	1.17	2.33	7.61
99	Planter - 6 Row	150.0	7.96	0.25	0.35	3.94	0.00	3.94	12.50
99	Rear Blade - 10'	200.0	0.96	0.03	0.04	0.66	0.00	0.66	1.69
99	Saddle Tank - 300 Gal	578.5	0.44	0.01	0.02	0.85	0.00	0.85	1.33
99	Spray Boom - 20'	428.5	0.09	0.00	0.00	0.13	0.00	0.13	0.22
99	Subsoiler - 8'	199.2	3.20	0.10	0.14	1.79	0.00	1.79	5.24
99	Subsoiler - 8'	199.2	3.20	0.10	0.14	1.79	0.00	1.79	5.24
99	Uncapper - 6 Row	199.5	2.32	0.07	0.10	1.17	0.00	1.17	3.66

Table 6.

U.C. COOPERATIVE EXTENSION
RANGING ANALYSIS
SAN JOAQUIN VALLEY - 1999
Cotton - Acala Variety, 30-Inch Row

	COSTS PER ACRE AT VARYING YIELDS TO PRODUCE COTTON						
	YIELD (LB/ACRE)						
	900	1,000	1,100	1,250	1,300	1,400	1,500
OPERATING COSTS/ACRE:							
Cultural Cost	559	559	559	559	559	559	559
Harvest Cost	61	67	73	82	85	92	98
Postharvest Cost	10	10	10	10	10	10	10
Interest on operating capital	29	29	29	29	29	29	29
TOTAL OPERATING COSTS/ACRE	659	665	671	680	683	689	696
TOTAL OPERATING COSTS/LB	0.66	0.60	0.56	0.50	0.49	0.46	0.43
CASH OVERHEAD COSTS/ACRE							
CASH OVERHEAD COSTS/ACRE	148	148	148	148	148	148	148
TOTAL CASH COSTS/ACRE	807	813	819	828	831	837	844
TOTAL CASH COSTS/LB	0.81	0.74	0.68	0.61	0.59	0.56	0.53
NON-CASH OVERHEAD COSTS/ACRE							
NON-CASH OVERHEAD COSTS/ACRE	103	103	103	103	103	103	103
TOTAL COSTS/ACRE	910	916	922	932	935	941	947
TOTAL COSTS/LB	0.91	0.83	0.77	0.69	0.67	0.63	0.59

NET RETURNS PER ACRE ABOVE OPERATING COSTS FOR COTTON								
PRICE (DOLLARS/LB)		YIELD (LBS/ACRE)						
Lint	PFC*	1,000	1,100	1,200	1,350	1,400	1,500	1,600
		913	913	913	913	913	913	913
0.55	0.076	-39	10	58	132	156	205	254
0.60	0.076	11	65	118	199	226	280	334
0.65	0.076	61	120	178	267	296	355	414
0.72	0.076	131	197	262	361	394	460	526
0.75	0.076	161	230	298	402	436	505	574
0.80	0.076	211	285	358	469	506	580	654
0.85	0.076	261	340	418	537	576	655	734

* Production Flexibility Contract

NET RETURNS PER ACRE ABOVE CASH COSTS FOR COTTON								
PRICE (DOLLARS/LB)		YIELD (LBS/ACRE)						
Lint	PFC*	1,000	1,100	1,200	1,350	1,400	1,500	1,600
		913	913	913	913	913	913	913
0.55	0.076	-187	-138	-90	-16	8	57	106
0.60	0.076	-137	-83	-30	51	78	132	186
0.65	0.076	-87	-28	30	119	148	207	266
0.72	0.076	-17	49	114	213	246	312	378
0.75	0.076	13	82	150	254	288	357	426
0.80	0.076	63	137	210	321	358	432	506
0.85	0.076	113	192	270	389	428	507	586

* Production Flexibility Contract

NET RETURNS PER ACRE ABOVE TOTAL COSTS FOR COTTON								
PRICE (DOLLARS/LB)		YIELD (LBS/ACRE)						
Lint	PFC*	1,000	1,100	1,200	1,350	1,400	1,500	1,600
		913	913	913	913	913	913	913
0.55	0.076	-291	-242	-193	-120	-95	-46	2
0.60	0.076	-241	-187	-133	-52	-25	29	82
0.65	0.076	-191	-132	-73	15	45	104	162
0.72	0.076	-121	-55	11	110	143	209	274
0.75	0.076	-91	-22	47	150	185	254	322
0.80	0.076	-41	33	107	218	255	329	402
0.85	0.076	9	88	167	285	325	404	482

* Production Flexibility Contract

Table 7.

U.C. COOPERATIVE EXTENSION
 COSTS AND RETURNS / BREAKEVEN ANALYSIS
 SAN JOAQUIN VALLEY - 1999
 Cotton - Acala Variety, 30-Inch Row

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)
Cotton	1033	680	353	827	205	931	102

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)
Cotton	516,374	339,761	176,613	413,707	102,667	465,435	50,939

BREAKEVEN PRICES PER YIELD UNIT

CROP	Base Yield (Units/Acre)	Yield Units	Breakeven Price To Cover		
			Operating Costs	Cash Costs	Total Costs
Cotton	1,338	Lb	0.47	0.58	0.65

BREAKEVEN YIELDS PER ACRE

CROP	Yield Units	Base Price (\$/Unit)	Breakeven Yield To Cover		
			Operating Costs	Cash Costs	Total Costs
Cotton	Lb	0.72	880.4	1,072.0	1,206.0