1999

U.C. COOPERATIVE EXTENSION

SAMPLE COSTS TO PRODUCE

~ COTTON~

PIMA VARIETIES
SAN JOAQUIN VALLEY

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INTRODUCTION

The detailed costs for Pima 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.

This study is intended as a guide only. It can be used to make production decisions, determine potential returns, prepare budgets and evaluate production loans. Sample costs given for labor, materials, equipment and contract services are based on current figures. Costs and practices detailed in this study will not be applicable to every situation. A blank, *Your Cost*, column is provided to enter your actual costs on.

Tables include:

For an explanation of calculations used for the study refer to the General Assumptions section, call the Department of Agricultural and Resource Economics, Cooperative Extension, University of California, Davis, California, (530) 752-3563 or call the farm advisor in your county.

Companion cost of production studies for cotton in the San Joaquin Valley are available and titled, "1999 Sample Costs To Produce Cotton, 40-Inch Row Acala Variety, San Joaquin Valley, 1999 Sample Costs To Produce Cotton, 30-Inch Row Acala Variety, San Joaquin Valley, and 1999 Sample Costs To Produce Cotton, Transgenic, Herbicide-Resistant Varieties, San Joaquin Valley".

Other cost studies are available for commodities grown in California. If you are interested in obtaining this or other studies please call the Department of Agricultural and Resource Economics, U.C. Davis, (530) 752-1515, or your county Cooperative Extension office.

ASSUMPTIONS

The following is a description of some general assumptions pertaining to sample costs of 38 and 40-inch row Pima 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, 160 acres are rented and planted to Pima cotton. Approximately 640 acres of the farm are planted to Acala cottonand the remaining 400 acres are 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 include 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 38 or 40-inch beds. Thirty-eight and 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, 38/40-inch row cotton. Please see the study titled, *1999 Sample Costs To Produce Cotton, 30-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 with Acala varieties suggests that yields for narrow row (30”) cotton are also higher than with 40-inch row cotton. Based on trials, lint yields for 30-inch row cotton should increase about 7% without any increase in applied water or fertilizer. This relative advantage for 30 row spacing has not been conclusively demonstrated in Pima cotton. 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.

Preplant and Early Herbicide Treatment. Weed control strategies and options are basically the same for Upland and Pima varieties. Pima's early growth habit allows more sunlight to penetrate to the soil surface. In some cases, this could result in increased early season weed pressure, but with proper use of pre-plant incorporated dinitroaniline herbicides, this has not been a concern. The foundation of an effective weed management program begins in or around February with a preplant herbicide incorporated at discing, using materials such as dinitroaniline herbicides. This application will control many early season annual broadleaf and grasses.

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 Rates/Conditions. The current San Joaquin Valley standard Pima S-7 seed size is 3600 seeds per pound. The optimum seeding rates are 15 to 20 pounds of seed for a desired plant stand of 40,000 plants per acre assuming 75 percent emergence. Replicated research trials have shown no yield disadvantages to populations ranging between 25,000 and 65,00 plants per acre. Keep seed rates on the lower side when planting under ideal conditions. Use higher rates when planting under marginal soil or weather conditions. A final stand of 60,000 or higher will require more intense management.

Weed Control. A mix of materials and cultural practices are used to manage weeds in cotton. Over-the-top herbicide applications for grasses and broadleafs generally begin in May, as do mechanical cultivations. Early over-the-top applications of Staple provide control, but Pima does respond differently to Staple than the Upland varieties, with definite injury symptoms (yellowing, stunting) that are greater in Pima and last longer than typically observed in Upland varieties. Data to date does not indicate long term detrimental effects on growth, development or reductions in yield with use of Staple. Mechanical cultivations begin after planting in April and the remaining two are done in April and May/June. The three cultivations in this study use rolling cultivators to eradicate weeds. An over-the-top herbicide for broadleafs and grasses, is sprayed in May. 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 the absence of clear data to the contrary, Pima should be monitored for insects and mites using the same techniques and economic thresholds as for Upland varieties. Current Pima varieties have shown higher tolerance to spider mites than Acala varieties. Conversely, cotton aphids and silverleaf whiteflies generally build up faster in Pima than in most Acala varieties. Pima appears to be damaged more from lygus than Upland varieties in many areas, but this observation has not been universally true in California. Since Pima is longer-maturing, it has the potential to encounter even more late aphid and silverleaf whitefly infestations than in Acala fields.

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.

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.

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.

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. Mites are not treated for in this study.

Defoliation Practices. Application of defoliants and desiccants are made prior to harvest to aid in improving a timely drop of leaves needed for a less-trashy, clean seedcotton harvest. Because of the more indeterminate growth habit of Pima, it is typically more difficult and costly to defoliate than Upland varieties. Improved irrigation and nitrogen fertilizer management, combined with timely harvest aid applications under favorable weather, can greatly improve efficacy of harvest aids. However, higher rates of defoliants and sequential (multiple) applications remain more common than in Upland production. Desiccant materials are more commonly needed than in Upland cotton to improve drying of leaves not removed by earlier defoliant applications or to deal with regrowth prior to harvest.

Proper timing and rates of defoliants are essential for good yields, lint quality, and efficient harvesting. A combination of defoliants are applied once in September and again in October.

Growth Regulators. Growth regulators are typically applied in late-June or July to attempt to improve the balance between vegetative and reproductive growth, avoiding rank growth and management problems that impact harvest dates and defoliation efficiency. Crop responses to growth regulators are generally less consistent in Pima than in Upland cotton, requiring use of multiple applications and higher rates than typical for Upland. Total growth regulator (mepiquat chloride) applications in Pima in recent years have been about twice the amount of material (higher rates, more applications) applied in Uplands, although grower practices vary widely.

Pesticides, rates, and cultural practices mentioned in this cost study and shown in Table 2 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.

Pima requires two passes over the field to pick the crop. Reasons for two picks are (1) better quality in earlier picks because they are less subject to unfavorable weather conditions that can damage cotton bolls left waiting to be open or mature; (2) longer boll production period in Pima means that bolls mature over a longer period than Upland. Second picks increase the expense of harvesting operations, but it is also likely that the second pick will cost less than the first, since harvest speeds will double that of the first pick.

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.

Lint Quality Concerns. Pima seedcotton yields and especially lint quality are highly sensitive to damage from high moisture content in modules and to high green leaf trash levels. Both of these problems can lead to serious problems in long-term module storage and with final lint grades. Since the price premium of Pima cotton is one of the main attractants for growers to consider Pima production, most cannot afford to sacrifice Pima quality. With the higher value of Pima lint and severe penalties for poorer quality, this places a higher priority on timely and early harvests of Pima fields.

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

USDA-HVI. The 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.

Supima Association. The Supima Association is a grower/industry association that collects a voluntary assessment for use in promoting and expanding U.S. Pima cotton, and in addressing key industry concerns through support of meetings, grower groups and industry discussions, and limited funding for research. The voluntary assessment is $3.00 per bale of cotton, with the funds collected by the first post-ginning handler of the cotton.

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 of an assumed lint yield of 1,163 pounds of lint and 2,067 pounds of seed per acre. This yield is based on an assumed Pima yield that is 93% of assumed Acala yields in these cost studies. This assumption is based upon long-term differenceds in statewide average yields between Acala and Pima acreage. Returns for various lint yields, government support program, and prices are shown in Table 6.

Returns. An estimated price of a $0.92 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.

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. Although farm equipment on pear orchards in Sacramento County 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 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.

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

Salvage Value. Salvage value is an estimate of the remaining market value of an investment at the end of its useful life. It is calculated differently for different investments. For farm machinery (e.g., tractors and implements) the remaining value is a percentage of the new cost of the investment. Salvage value is calculated as

$$New\ Price \times \%\, Remaining\ Value$$

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
Pima Varieties, 40-Inch Row

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

Interest Rate: 9.69%
Yield per Acre: 1,163 Lb of Lint

Operation	Time (Hrs/A)	Labor Cost	Fuel,Lube & Repairs	Material Cost	Custom/ Rent	Total Cost	Your Cost
		---------- Cash and Labor Costs per Acre ----------					
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	20	0	27	
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	
Weed Control - Hand Hoe	3.00	24	0	0	0	24	
Weed Control - Post Directed Herbicide Spray	0.29	4	3	10	0	17	
Insect Control - Lygus 1.5X	0.00	0	0	46	12	58	
Insect Control - Aphids	0.00	0	0	16	8	25	
Apply Growth Regulator & KNO^3	0.00	0	0	21	8	29	
Fertilizer - Sidedress UN-32	0.25	3	2	33	2	40	
Apply Growth Regulator	0.00	0	0	8	8	16	
Defoliate Cotton 3X	0.00	0	0	47	24	71	
Advising Services	0.00	0	0	0	10	10	
Pickup Truck Use	0.24	6	1	0	0	7	
TOTAL CULTURAL COSTS	11.34	110	40	353	72	575	
Harvest:							
Harvest - 1st Pick	0.65	9	14	0	0	22	
Harvest - 2nd Pick	0.33	4	7	0	0	11	
Build Module & Tarp	0.17	4	2	4	0	10	
Haul & Gin Cotton	0.00	0	0	0	0	0	
Compress Cotton	0.00	0	0	0	17	17	
TOTAL HARVEST COSTS	1.15	17	23	4	17	60	
Assessments:							
USDA - HVI	0.00	0	0	3	0	3	
Supima Association	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	
California Cotton Growers & Ginners Assc.	0.00	0	0	0	0	0	
TOTAL ASSESSMENT COSTS	0.00	0	0	16	0	16	
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		131	69	373	89	691	
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						839	
TOTAL CASH COSTS/LB						0.65	

CAPITAL RECOVERY COSTS (7.4% Interest Rate):			
	Per producing	-- Annual Cost --	
Investment	Acre	Capital Recovery	
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	590	92	92
TOTAL CAPITAL RECOVERY COSTS	700	103	103
TOTAL COSTS/ACRE			942
TOTAL COSTS/LB			0.73

Table 2.

U.C. COOPERATIVE EXTENSION
COSTS AND RETURNS PER ACRE TO PRODUCE COTTON
SAN JOAQUIN VALLEY - 1999
Pima Varieties, 40-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	1,163	Lb	0.92	1,070	
Cottonseed	Seed credit used to pay ginning fees.			0	
TOTAL GROSS RETURNS				1,070	
OPERATING COSTS					
Herbicide:					
Treflan Pro 5	1.50	Pint	5.36	8	
Staple	0.38	Oz	49.33	19	
Caparol	1.50	Qt	6.94	10	
Irrigation:					
Water	2.50	AcFt	50.00	125	
Seed:					
Cotton Seed	15.00	Lb	1.36	20	
Insecticide:					
Capture	9.00	Oz	5.08	46	
Provado	3.75	Oz	4.40	16	
Custom:					
Air Application	7.50	Acre	8.00	60	
Ginning	(paid by seed credit)			0	
Compression Fee	2.33	Bale	7.50	17	
Growth Regulator:					
Mepiquat chloride	1.50	Pint	15.42	23	
Fertilizer:					
13-0-46	10.00	Lb	0.566	6	
UN-32	150.00	Lb N	0.22	33	
Rent:					
Fertilizer Applicator	1.00	Acre	1.50	2	
Defoliant:					
Prep	2.00	Pint	12.87	26	
Def	2.00	Pint	6.70	13	
Sodium Chloride	2.00	Gal	0.99	2	
Starfire	16.00	Oz	0.34	5	
Harvest Aid:					
Tarps - Module	0.06	Tarp	62.00	4	
Assessment:					
HVI Classing Fee	2.33	Bale	1.25	3	
Supima Association	2.33	Bale	3.00	7	
Pink Bollworm Project	2.33	Bale	2.00	5	
National Cotton Council	2.33	Bale	0.45	1	
California Cotton Growers & Ginners Assc.	2.33	Bale	0.12	0	
Contract:					
PCA/Consultant Fee	1.00	Acre	10.00	10	
Labor (machine)	6.05	Hrs	10.93	66	
Labor (non-machine)	8.26	Hrs	7.86	65	
Fuel - Gas	0.48	Gal	1.02	0	
Fuel - Diesel	44.38	Gal	0.62	28	
Lube				4	
Machinery repair				37	
Interest on operating capital @ 9.69%				29	
TOTAL OPERATING COSTS/ACRE				691	
NET RETURNS ABOVE OPERATING COSTS				379	

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	813
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	93
TOTAL NON-CASH OVERHEAD COSTS/ACRE	103
TOTAL COSTS/ACRE	942
NET RETURNS ABOVE TOTAL COSTS	128

Table 3. U.C. COOPERATIVE EXTENSION
MONTHLY CASH COSTS PER ACRE TO PRODUCE COTTON
SAN JOAQUIN VALLEY – 1999
Pima Varieties, 40-Inch Row

Beginning NOV 98 Ending NOV 99	NOV 98	DEC 98	JAN 99	FEB 99	MAR 99	APR 99	MAY 99	JUN 99	JUL 99	AUG 99	SEP 99	OCT 99	NOV 99	TOTAL
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						27								27
Uncap Beds						3								3
Cultivate - 4X						3	3	6						12
Weed Control - Over-The-Top Spray							25							25
Weed Control - Hand Hoe								24						24
Weed Control - Post Directed Spray								17						17
Insect Control - Lygus 1.5X								38	19					58
Insect Control - Aphids									25					25
Apply Growth Regulator & KNO^3									29					29
Fertilizer - Sidedress UN-32									40					40
Apply Growth Regulator										16				16
Defoliate Cotton 3X												71		71
Advising Services	1	1	1	1	1	1	1	1	1	1	1	1	1	10
Pickup Truck Use	1	1	1	1	1	1	1	1	1	1	1	1		7
TOTAL CULTURAL COSTS	44	1	1	44	4	34	29	117	176	48	2	72	1	575
Harvest:														
Harvest - 1st Pick													22	22
Harvest - 2nd Pick													11	11
Build Module & Tarp													10	10
Haul & Gin Cotton													0	0
Compress Cotton													17	17
TOTAL HARVEST COSTS													60	60
Assessment:														
USDA - HVI													3	3
Supima Association													7	7
Cotton Pest Control Project													5	5
National Cotton Council													1	1
California Cotton Growers & Ginners Assc.													0	0
TOTAL ASSESSMENT COSTS													16	16
Postharvest:														
Chop Stalks													4	4
Disc Residue - 2X													6	6
TOTAL POSTHARVEST COSTS													10	10
Interest on operating capital	0	0	0	1	1	1	1	2	4	4	4	5	5	29
TOTAL OPERATING COSTS/ACRE	44	2	2	44	5	35	31	120	180	52	6	77	93	691
CASH 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	0	0	0	0	0	0	0	0	0	0	0	0		1
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	39	33	122	185	54	8	81	204	839

U.C. COOPERATIVE EXTENSION

Table 4. WHOLE FARM ANNUAL EQUIPMENT, INVESTMENT, AND BUSINESS OVERHEAD COSTS
SAN JOAQUIN VALLEY - 1999
Pima Varieties, 40-Inch Row

ANNUAL EQUIPMENT COSTS

Yr	Description	Price	Yrs Life	Salvage Value	Capital Recovery	-- Cash Overhead -- Insurance	Taxes	Total
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

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

ANNUAL INVESTMENT COSTS

Description	Price	Yrs Life	Salvage Value	Capital Recovery	-------Cash Overhead ------- Insurance	Taxes	Repairs	Total
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	110.00	55,000
Liability Insurance	1,200	Acre	0.80	960
Office Expense	1,200	Acre	25.00	30,000
Sanitation Facilities	1,200	Acre	3.15	3,780

Table 5.

U.C. COOPERATIVE EXTENSION
HOURLY EQUIPMENT COSTS
SAN JOAQUIN VALLEY – 1999
Pima Varieties, 40-Inch Row

			COSTS PER HOUR						
				-- Cash Overhead --			Operating		
Yr	Description	Actual Hours Used	Capital Recovery	Insur-ance	Taxes	Repairs	Fuel & Lube	Total Oper.	Total Costs/Hr.
99	110 HP 2WD Tractor	1,513.2	3.45	0.13	0.18	3.12	4.55	7.67	11.42
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	178.8	73.71	1.90	2.66	12.86	6.62	19.48	97.75
99	Harvester - 2 Row	178.8	73.71	1.90	2.66	12.86	6.62	19.48	97.75
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	435.7	0.59	0.02	0.03	0.85	0.00	0.85	1.48
99	Spray Boom - 20'	285.7	0.13	0.00	0.01	0.13	0.00	0.13	0.27
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
Pima Varieties, 40-Inch Row

COSTS PER ACRE AT VARYING YIELDS TO PRODUCE PIMA COTTON

	YIELD (LB/ACRE)						
	900	1,000	1,100	1,250	1,300	1,400	1,500
OPERATING COSTS/ACRE:							
Cultural Cost	575	575	575	575	575	575	575
Harvest & Assessment Costs	57	63	70	77	83	90	97
Postharvest Cost	10	10	10	10	10	10	10
Interest on operating capital	29	29	29	29	29	29	29
TOTAL OPERATING COSTS/ACRE	670	676	683	690	697	703	710
TOTAL OPERATING COSTS/LB	0.79	0.71	0.65	0.60	0.56	0.52	0.49
CASH OVERHEAD COSTS/ACRE	148	148	148	148	148	148	148
TOTAL CASH COSTS/ACRE	818	824	831	838	844	851	858
TOTAL CASH COSTS/LB	0.96	0.87	0.79	0.73	0.68	0.63	0.59
NON-CASH OVERHEAD COSTS/ACRE	103	103	103	103	103	103	103
TOTAL COSTS/ACRE	921	928	934	941	948	954	961
TOTAL COSTS/LB	1.08	0.98	0.89	0.82	0.76	0.71	0.66

NET RETURNS PER ACRE ABOVE OPERATING COSTS FOR PIMA COTTON

PRICE (DOLLARS/LB)	YIELD (LB/ACRE)						
Lint	850	950	1,050	1,150	1,250	1,350	1,450
0.75	-32	36	104	173	241	309	378
0.80	10	84	157	230	303	377	450
0.85	53	131	209	288	366	444	523
0.90	95	179	262	345	428	512	595
0.95	138	226	314	403	491	579	668
1.00	180	274	367	460	553	647	740
1.05	223	321	419	518	616	714	813

NET RETURNS PER ACRE ABOVE CASH COSTS FOR PIMA COTTON

PRICE (DOLLARS/LB)	YIELD (LB/ACRE)						
Lint	850	950	1,050	1,150	1,250	1,350	1,450
0.75	-180	-112	-44	25	93	161	230
0.80	-138	-64	9	82	156	229	302
0.85	-95	-17	61	140	218	296	375
0.90	-53	31	114	197	281	364	447
0.95	-10	78	166	255	343	431	520
1.00	32	126	219	312	406	499	592
1.05	75	173	271	370	468	566	665

NET RETURNS PER ACRE ABOVE TOTAL COSTS FOR PIMA COTTON

PRICE (DOLLARS/LB)	YIELD (LB/ACRE)						
Lint	850	950	1,050	1,150	1,250	1,350	1,450
0.75	-283	-215	-147	-78	-10	58	126
0.80	-241	-168	-94	-21	52	126	199
0.85	-198	-120	-42	37	115	193	271
0.90	-156	-73	11	94	177	261	344
0.95	-113	-25	63	152	240	328	416
1.00	-71	22	116	209	302	396	489
1.05	-28	70	168	267	365	463	561

Table 7.

U.C. COOPERATIVE EXTENSION
COSTS AND RETURNS / BREAKEVEN ANALYSIS
SAN JOAQUIN VALLEY - 1999
Pima Varieties, 40-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	1,070	691	379	839	231	942	128

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	534,980	345,358	189,622	419,293	115,687	470,902	64,078

BREAKEVEN PRICES PER YIELD UNIT

CROP	Base Yield (Units/Acre)	Yield Units	Breakeven Price To Cover Operating Costs	Breakeven Price To Cover Cash Costs	Breakeven Price To Cover Total Costs
			$ per Yield Unit		
Cotton	1,163	Lb	0.59	0.72	0.81

BREAKEVEN YIELDS PER ACRE

CROP	Yield Units	Base Price ($/Unit)	Breakeven Yield To Cover Operating Costs	Breakeven Yield To Cover Cash Costs	Breakeven Yield To Cover Total Costs
			Yield Units /Acre		
Cotton	Lb	0.92	750.80	911.50	1,023.70