UNIVERSITY OF CALIFORNIA COOPERATIVE EXTENSION

2003

SAMPLE COSTS TO PRODUCE

COTTON

PIMA TYPE

SAN JOAQUIN VALLEY

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SAMPLE COST TO PRODUCE COTTON – PIMA VARIETY
SAN JOAQUIN VALLEY - 2003

CONTENTS

INTRODUCTION

Sample costs for SJV Pima cotton production in the San Joaquin Valley (SJV) are presented in this study. 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 production procedures considered typical for growing conditions in the San Joaquin Valley region. Sample costs given for labor, materials, equipment and contract services are based on current figures. Some costs and practices used in this study may not be applicable to your situation. A blank *Your Cost* column is provided to enter your actual costs on Tables 1 and 2.

For an explanation of calculations used for the study refer to the Assumptions or call the Department of Agricultural and Resource Economics, University of California- Davis, (530) 752-3589 or the UC Cooperative Extension Farm Advisor in the county of interest**.**

Sample cost and return studies for many commodities are available and can be requested through the Department of Agricultural and Resource Economics, UC Davis. Current studies can be downloaded from the department website at http://coststudies.ucdavis.edu or obtained from selected county UC Cooperative Extension offices.

ASSUMPTIONS

The following assumptions give background information relevant to the values shown in Tables 1 to 6 and pertain to sample costs for producing SJV Pima cotton in the San Joaquin Valley region. **The costs are based on typical cultural practices used by farmers in the San Joaquin Valley and are not University of California recommendations.** Some farming practices described may not be used during every production year or on every farm, while some operations not described may be needed. *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 1,500 acres of non-contiguous land, which includes 750 acres rented and planted to Pima cotton. The remaining acres are planted to other field and row crops including processing tomatoes, corn, wheat, alfalfa, barley, onions, garlic, carrots, lettuce and broccoli. Land rental costs are described in the "Cash Overhead Costs" section of the text and tables. The owner manages the farm.

Production Operating Costs

Tables 1-3 show the costs associated with ground preparation, planting, growing, and harvesting cotton. Land preparation is done from October to March and the cotton is harvested in October and November. The crop year in this study is November to November.

Land Preparation. The ground is ripped or subsoiled in two passes, 2 to 3 feet deep, to break up compaction, which affects root penetration and water infiltration. In this study subsoiling is done once every three years and one-third of the cost is allocated to the crop each year. The ground is then disced twice with a stubble disc to break up large clods and smooth the surface. The ground is again disced twice with a finish disc (offset disc) – once while applying an herbicide and once to further incorporate the herbicide and smooth the surface. Afterwards the beds are listed.

Row Spacing. The assumption for this Pima study is 38 or 40 inch row spacing. Unlike the Acala types of cotton, for which there is data to support a different cost study for 30 inch versus 40 inch row spacing, yield response comparisons for Pima under these different row spacings are quite limited.

Planting. A Pima cotton variety is seeded at a rate of 15 to 20 pounds per acre on 38 or 40-inch beds during April. Cotton is planted using a six-row planter. Enough seed is planted to achieve a desirable stand of 40,000 to 50,000 plants per acre. Populations can range from about 30,000 to 65,000 plants per acre, without any significant effects on total production. Available yield data on responses to plant population in Pima suggest that except under conditions of low vigor (compacted soil, low nutrients, saline soil), plant populations significantly higher than 60,000 to 70,000 plants per acre are likely to reduce yields and delay harvest. The seed cost includes the San Joaquin Valley Cotton Board assessment. (See Assessment Section).

Irrigation. In this study a water cost of $60 per acre-foot is used. Grower applied water ranges from 2.0 to 3.5 acre feet based upon soil type, irrigation method, water application uniformity, crop rooting depth in some soils, evaporation, and runoff. Based on current information it is estimated that 2.5 acre-feet of water is applied during the growing season for cotton in this region, though this amount is dependent upon soil and climatic factors. 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 irrigation district, its limits on available water, and changes in energy costs by the district or grower for running irrigation wells where groundwater is available as a backup water supply. Water costs depending on irrigation district or pumping variables can range from $20 per acre-foot to over $140 per acre-foot for late season irrigation in water-short districts.

Most University or USDA irrigation studies comparing Pima and Acala cotton water use in the SJV indicate similar water use in the two types of cotton, although some more recent studies indicated slightly higher (5% to a maximum of 10% higher) water use in Pima cotton due to the potential for a longer growing season with some recent Pima varieties. Growers may consider factoring in higher water use estimates for Pima if that matches their practice or experience.

In this example, the rented land has an irrigation system adequate to irrigate the total cotton acreage The irrigation system cost, therefore, is included as part of the land rental cost, which is under the category later described as "Cash Overhead Costs". A ditch-based furrow irrigation system is assumed for this example.

Fertilization. Nitrogen is the primary nutrient applied to cotton throughout the growing season. UN-32 (32-0-0) is sidedressed at a rate of 150 pounds of N per acre during May. A fertilizer applicator is rented from the fertilizer dealer to sidedress the N. Thirty pounds of N as UN-32 is water run in July. The labor for the water run N is included in the irrigation labor costs. 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. The desirability of the water run nitrogen in July is largely dependent upon the yield potential of the plant and relative plant vigor (i. e. the better the yield potential on the plant, or the lower the vigor, the more likely that a favorable and cost-effective response will be obtained with later water-run nitrogen applications). Care must be exercised in particular with late-season nitrogen management in Pima cotton, as many Pima varieties have a pronounced tendency to sustain vegetative growth well into late-summer and early fall, and can be hard to prepare for a timely harvest. If the crop rotation includes heavily-fertilized vegetable crops or alfalfa, or if dairy waste or manure applications are common practices on individual fields, residual soil nitrogen and even potassium may be high. These situations would then present an opportunity to reduce input costs and lower applied nitrogen, resulting in fewer problems with excessive growth, delayed harvest, and leaching losses.

Pest Management. The pesticides, rates, and cultural practices mentioned in this cost study are listed in the *UC IPM Pest Management Guidelines-Cotton* **Pesticides mentioned in this study are not recommendations, but those commonly used in the region.** For information and pesticide use permits, contact the local county Agricultural Commissioner's office. For information on other pesticides available, pest identification, monitoring, and management, visit the UC IPM website at www.ipm.ucdavis.edu. **Pest control costs can vary considerably each year depending upon local conditions and pests in any given year. Ranges can be as dramatic as $50 per acre for one year and $200 the next.**

Pest Control Adviser (PCA). Written recommendations are required for many pesticides and are made by licensed pest control advisers. In addition the PCA or an agronomist consultant will monitor the field for agronomic problems including pests and nutrition. Growers may hire private PCA's or receive the service as part of a service agreement with an agricultural chemical and fertilizer company. In this study, a fee is allocated for a PCA.

Insects. In the absence of clear data to the contrary, Pima cotton should be monitored for insects and mites using the same techniques and economic thresholds as for Upland varieties. Common observations among University researchers as well as PCA's are that: (1) Pima varieties typically exhibit lower spider mite populations and a higher tolerance to spider mites than Acala types of cotton; (2) cotton aphids and silverleaf whitefly build up faster and can cause more problems in Pima than in Acala cotton; and (3) fruit loss in Pima varieties can be worse than in Acala types at similar Lygus bug populations. Since under typical management, most Pima varieties require a longer growing season to mature than Acala types, Pima has a longer potential period of exposure to late-season insect pests than typical for Acala types of cotton, which could increase insect control costs. This information should be kept in mind when planning for Pima production costs, but without clear documentation of higher costs in University studies, assumed insect management practices will be the same as in the Acala cost study.

In this study, pest management is for mites, aphids, and lygus. An aerial application of Zephyr is made in May for mite control, Warrior insecticide in June for lygus control, and Provado insecticide in July for aphid control. Monitoring of insect populations is necessary to determine if and when to treat the crop.

Lygus bugs feed on the squares (flower buds) and small fruit (bolls). Damaged squares will usually drop off while damaged bolls at a minimum may have stained lint and damaged seeds, or can be lost if damaged when bolls are less than 10 to 12 days of age past the flower stage. In cases where there are repeated or sustained infestations of lygus bugs, it is not uncommon for growers to need more than the assumed one insecticide application for lygus control.

Aphids cause physical damage to the leaves and/or contaminate the lint with their honeydew production. Also, their feeding may reduce the carbohydrates needed for boll maturation, resulting in yield loss. Mites feeding on the leaves reduce plant vigor and result in extensive defoliation.

Cost estimates do not include insecticide applications for beet armyworm control. In some years and/or locations, beet armyworm can develop in populations capable of significant yield reductions, and their control may be an additional expense in some situations.

Cost estimates also do not include control measures for silverleaf whitefly, which can be a major late-season pest in parts of the southern and even central San Joaquin Valley. Silverleaf whitefly has the potential to cause sticky cotton and reduce the value of cotton lint (fiber). Insect growth regulators and insecticides are available to aid in control, but costs are highly variable by location and timing of infestations, choice of control measures, and the number of applications required. Similarly, if aphid problems continue into the late-season when bolls open and cotton lint is exposed to aphid honeydew, another insecticide application in addition to the assumed one application may be required to prevent sticky cotton.

Weeds. In November, a pre-emergent herbicide (Treflan) is applied and incorporated in the fields at discing. This application will control many early season annual broadleaves and grasses. An "over-the-top" herbicide, Staple in this study, for broadleaf weed control is sprayed in May. Cultivation begins in late April (depending upon planting date) and continues until the end of June. A total of four cultivations are done in this study, using rolling cultivators. The first cultivation is made prior to planting in March and the remaining three are done from April to June. The fields are hand hoed in June. Also, a post-directed herbicide/layby treatment with Caparol is made in June.

Growth Regulator & Defoliation. A plant growth regulator (mepiquat chloride, also known as "Pix" or other trade names) is applied at one pint per acre in late June or July and again a second time at one-half pint in late-July or early August. The total number of applications and rates used can vary with a number of factors in the range of current production practices used in the SJV. Considerations include: (1) the degree to which growers use delayed irrigations to aid in limiting vegetative growth; (2) the lateness of the crop; (3) soil factors such as as prevailing nitrogen levels or salinity levels. Under low vigor conditions such as in saline soil, or compacted soil conditions, caution is warranted to avoid negative impacts of too high a rate of growth regulator application.

Harvest aid chemicals, often called by the group name "Defoliants" are applied in September and/or October. Typical harvest aid applications include two application timings, with materials such as Prep and Ginstar applied in the first application, and a second application 14 days or more later with materials such as Defol and Gramoxone Max.

Plant growth regulators control excessive vegetative growth and promote a balance between vegetative and reproductive growth. Defoliants are applied prior to picking to aid harvest by causing the leaves to drop. Defoliation reduces the amount of trash collected with the cotton, and reduces staining of the lint. Because of the more indeterminate growth than upland varieties, the Pima varieties may need additional applications as well as the use of higher rates.

Harvest. The farm in this study owns two four-row cotton pickers and two module builders. The cotton is dumped from the harvester directly into the module builder that presses loose seed cotton into a dense and economical unit for transportation to the gin. A tractor and tractor driver monitor each module. Two laborers maintain the area – cleaning cotton off the ground – during the harvest.

The assumption for this cost study is that Pima cotton requires two harvests, with the second harvest required to collect seed-cotton from later-maturing bolls. For the second harvest, the grower again uses two pickers, but only one module builder due to reduced yields per acre. Harvest time is reduced due to faster harvesting speeds compared to the first picking and less time required for dumping. Pima cotton matures over a longer time than upland cotton; better quality is obtained in the first pick due to favorable weather conditions earlier in the season. Depending on the value of Pima seed and lint, in years with good early boll set and warm pre-harvest weather, many newer Pima varieties can mature more evenly and require only one pick for harvest. Growers may choose to adjust the harvest costs accordingly if that is the typical harvest experience in their area.

Typical custom picking costs for Pima cotton are $80 to $90 per acre for the first pick and $30 per acre second pick. 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.

Yields. The crop yield used for calculations in this study is 1,150 pounds of lint and 2,067 pounds of seed per acre. Pima cotton is assumed to yield 92 to 93% of Acala, based upon long-term differences in statewide average yields between the two varieties. Since a yield of 1,250 pounds of lint per acre was used in the Acala cost studies, the 1,150 pounds of lint per acre yield represents 92% of the yield used in the Acala study. Returns for various lint yields are shown in Table 6.

Returns. An estimated price of $0.90 per pound of lint is used to calculate returns. The price is based on current returns and from county averages over the last five years. Some cooperative cotton gins pay growers as much as $5 to $25 per bale for seed credit above grower ginning costs, but is not a regular practice. Table 6 shows grower returns based on varying yields.

Revenue from federal government programs. The typical revenue available for the Acala's (Upland cotton) is not available to the Pima (Extra Long Staple [ELS]) producers.

Nonrecourse Marketing Assistance Loans. If market conditions are not good, the grower can store the crop and borrow on it to pay the accumulated production costs. He can later sell the crop, repay the loan, accrued storage and related costs. The ELS cotton loan rate is $0.7977 per pound. The price in the study is above the loan rate, so the crop would not go into loan. For additional information, contact your USDA Farm Service Agency.

Transportation. Transportation costs are based on roundtrip distances from the field to the gin. Most gins within a close radius of the field do not charge because the cost is included in the ginning fee. Longer hauls (over 40 miles round trip) will have a hauling charge. Hauling companies may also have a surcharge for modules less than a minimum weight.

Ginning. Commercial cotton gins normally keep the cottonseed and give growers a credit to cover ginning and transportation costs; therefore, most growers do not see a ginning charge. In this study, ginning fees are covered by the seed credit and are not included as a line-item cost. Some gins especially cooperatives may return to the grower a net difference of $5 to $25 per bale between the seed value and ginning costs.

Cotton gins charge growers for compressing lint into universal density (UD) bales for shipping. In this study a fee of $7.00 per bale is charged which includes hydraulic compressing, a sample for the merchant, and a loading charge. Some ginners also charge a $1 invoicing fee, but the fee is not included in this study.

Assessments. Most assessments are collected by the gin or handler and deducted from the growers' gross returns. Both mandatory and voluntary assessments are discussed below.

USDA-HVI. The USDA levies a fee for High Volume Instrumentation (HVI) classing. This determines the marketing classification cotton grade. 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 to pay $1.00 per bale plus a supplemental 0.5% lint assessment on the current gross value lint returns per bale. The supplemental assessment in this study is $1.75 per bale ($0.70 x .005 x 500 lb bale).

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.

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. The growers are charged $0.15 per bale and the ginners are charged $0.15 per bale. Participation in this organization is voluntary.

San Joaquin Valley Cotton Board. The board reviews test program data and approves variety releases. Most of the money goes to the University of California for variety evaluation. The assessment is added to the seed price. The current assessment paid by the grower is $3.75 per planting seed hundredweight. Revenue collected by the board in 2001 averaged $0.85 per producing acre.

Supima Association. The Supima Association, composed of American Pima cotton growers, promotes U.S. Pima cotton, and is also involved in quality assurance, research programs, and working with government agencies to maintain a viable marketing environment. The voluntary assessment is $3.00 per bale. The funds are collected by the first post-ginning handler of the cotton.

Pickup. Two pickups – one-half ton and three-quarter ton – are used on the ranch. It is assumed that each pickup travels 4,998 miles each year for total ranch use.

Labor. Basic hourly wages for workers are $9.51 per hour for machine operators and $8.23 per hour for non-machine workers. Adding 34% for the employers share of federal and state payroll taxes and other benefits raises the total labor costs to $12.74 per hour for machine operators and $11.02 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.

Equipment Operating Costs. 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, and fuel type. Prices for on-farm delivery of diesel and gasoline are $1.11 and $1.58 per gallon, respectively. The fuel prices are a January 2003 average based on four California delivery locations. The cost includes a 2.25% sales tax (effective September 2001) on diesel fuel and 7.25% sales tax on gasoline. Gasoline also includes federal and state excise tax, which can be refunded for on-farm use when filing your income tax. The fuel, lube, and repair cost per acre for each operation in Table 1 is determined by multiplying the total hourly operating cost in Table 5 for each piece of equipment used for the selected operation by the hours per acre. Tractor time is 10% higher than implement time for a given operation to account for setup, travel and down time.

Interest on Operating Capital. Interest on operating capital is based on cash production costs and is calculated monthly until harvest at a nominal rate of 7.14% per year. A nominal interest rate is the typical market cost of borrowed funds. The interest cost of post harvest operations is discounted back to the last harvest month using a negative interest charge.

Risk. The risks associated with crop production 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.

Cash Overhead Costs

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, equipment repairs, and management.

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.

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 0.676% of the average value of the assets over their useful life. Liability insurance covers accidents on the farm and costs $1,246 for the entire farm.

Office Expense. Office and business expenses are estimated at $30 per acre. These expenses include office supplies, telephones, bookkeeping, accounting, legal fees, shop, and office utilities, and miscellaneous administrative charges.

Land Rent. The land is rented on a cash basis for $150 per acre. The agreement includes the use of the irrigation system on the property. The general consensus from those in the industry is that Pima is grown on the so called “better land” as compared the the Acala cotton. Thus the grower pays a higher rent per acre for Pima than Acala cottons.

Investment Repairs. Annual maintenance is calculated as 2% of the purchase price.

Non-Cash Overhead Costs

Non-cash overhead is calculated as the capital recovery cost for equipment and other farm investments.

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). 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 formula

for the calculation of the annual capital recovery costs is ((Purchase Price – Salvage Value) x Capital Recovery Factor) + (Salvage Value x Interest Rate).

Salvage Value. Salvage value is an estimate of the remaining value of an investment at the end of its useful life. For farm machinery (tractors and implements) the remaining value is a percentage of the new cost of the investment (Boehlje and Eidman). The percent remaining value is calculated from equations developed by the American Society of Agricultural Engineers (ASAE) based on equipment type and years of life. The life in years is estimated by dividing the wear out life, as given by ASAE, by the annual hours of use in this operation. For other investments including irrigation systems, buildings, and miscellaneous equipment, the value at the end of its useful life is zero. The salvage value for equipment and investments are shown in Table 5.

Capital Recovery Factor. Capital recovery factor is the amortization factor or annual payment whose present value at compound interest is 1. The amortization factor is a table that corresponds to the interest rate used and the life of the machine.

Interest Rate. The interest rate of 6.25% used to calculate capital recovery cost is the USDA-ERS's ten-year average of California's agricultural sector long-run 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 agriculture sector. In other words, the next best alternative use for these resources is in another agricultural enterprises.

Land. The grower owns 750 acres of row-crop land valued at $3,300 per acre. Values for land with relatively secure irrigation water supplies in the region range from $700 per acre to $5,000, depending upon location and soil condition. The site for the cotton in this study is rented land enrolled in the government subsidy program, but is not available for Pima growers.

Building. The buildings are metal buildings erected on a cement slab and cover approximately 2,400 square feet.

Tools. This includes shop tools, hand tools, and miscellaneous field tools. The number is not based upon an actual or average inventory.

Fuel Tanks. Diesel and gasoline fuel tanks with electric pumps are set up in a cement containment pad that meets federal, state, and county regulations.

Equipment. Farm equipment is purchased new or used, but the 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 for equipment and other investments are shown in Table 6. Equipment costs are composed of three parts: non-cash overhead, cash overhead, and operating costs. Both of the overhead factors have been discussed in previous sections. The operating costs consist of repairs, fuel, and lubrication and are discussed under operating costs.

Table Values. Due to rounding, the totals may be slightly different from the sum of the components.

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For information concerning the above mentioned University of California publications contact UC DANR Communications Services (1-800-994-8849) or your local county Cooperative Extension office.

UC COOPERATIVE EXTENSION

Table 1. COSTS PER ACRE to PRODUCE PIMA COTTON

SAN JOAQUIN VALLEY - 2003

Operation	Operation Time (Hrs/A)	Cash and Labor Cost per acre					
		Labor Cost	Fuel, Lube & Repairs	Material Cost	Custom/ Rent	Total Cost	Your Cost
Cultural:							
Rip Fields 1X/3Yrs	0.27	4	7	0	0	11	
Primary Discing 2X	0.25	4	7	0	0	11	
Weed Control - Apply Herbicide	0.20	3	4	5	0	12	
Weed Control - Incorporate Herbicide w/Disc	0.14	2	3	0	0	5	
List Beds	0.07	1	1	0	0	2	
Make Ditch	0.06	1	1	0	0	2	
Irrigate (Labor includes water run UN32)	5.00	55	0	150	0	205	
Fertilizer - Water Run UN32	0.00	0	0	8	0	8	
Close Ditch	0.06	1	1	0	0	2	
Cultivate – Preplant	0.10	2	1	0	0	3	
Plant	0.12	2	2	22	0	26	
Uncap Beds	0.08	1	1	0	0	2	
Cultivate - 3X	0.31	5	4	0	0	9	
Fertilizer - Sidedress UN32	0.14	2	2	39	2	45	
Weed Control - Over-The-Top Spray	0.20	3	2	18	0	24	
Insect Control - Mites	0.00	0	0	36	8	43	
Weed Control - Hand Hoe	5.00	55	0	0	0	55	
Weed Control - Post Directed/Layby Spray	0.20	3	2	16	0	21	
Insect Control - Lygus	0.00	0	0	9	8	16	
Insect Control - Aphids	0.00	0	0	16	8	24	
Growth Regulator	0.00	0	0	23	15	38	
Defoliate Cotton 2X	0.00	0	0	54	15	69	
PCA	0.00	0	0	0	12	12	
Pickup Truck Use	0.44	7	2	0	0	9	
TOTAL CULTURAL COSTS	12.64	151	40	395	67	653	
Harvest:							
Harvest 2X	0.50	8	32	0	0	40	
Build Module and Haul 2X	0.50	13	7	0	0	20	
TOTAL HARVEST COSTS	1.00	20	39	0	0	60	
Gin:							
Gin (paid by seed credit)	0.00	0	0	0	0	0	
Gin Compression Charge	0.00	0	0	0	16	16	
TOTAL GIN COSTS	0.00	0	0	0	16	16	
Assessment:							
Assessments	0.00	0	0	23	0	23	
TOTAL ASSESSMENT COSTS	0.00	0	0	23	0	23	
Postharvest:							
Chop Stalks	0.13	2	2	0	0	3	
Disc Residue - 2X	0.24	4	7	0	0	11	
TOTAL POSTHARVEST COSTS	0.37	5	9	0	0	14	
Interest on operating capital @ 7.14%						25	
TOTAL OPERATING COSTS/ACRE		176	89	418	83	791	
Cash Overhead:							
Land Rent Cotton						150	
Office Expense						30	
Liability Insurance						1	
Property Taxes						5	
Property Insurance						4	
Investment Repairs						3	
TOTAL CASH OVERHEAD COSTS						192	
TOTAL CASH COSTS/ACRE						983	

UC COOPERATIVE EXTENSION
Table 1. continued

			Total Costs	Your Costs
Non-Cash Overhead:	Per Producing Acre	Annual Cost Capital Recovery		
Buildings 2,400sqft	40	3	3	
Fuel Tanks 2-500 gal	4	0	0	
Shop/Field Tools	8	1	1	
Siphon Pipes 3"x 90"	5	1	1	
Service Truck 2-Ton	84	10	10	
Equipment	725	89	89	
TOTAL NON-CASH OVERHEAD COSTS	866	104	104	
TOTAL COSTS/ACRE			1,087	

UC COOPERATIVE EXTENSION

Table 2. COSTS AND RETURNS PER ACRE to PRODUCE PIMA COTTON

SAN JOAQUIN VALLEY - 2003

	Quantity/ Acre	Unit	Price or Cost/Unit	Value or Cost/Acre	Your Cost
GROSS RETURNS					
Lint	1,150.00	lb	0.90	1,035	
OPERATING COSTS					
Herbicide:					
Treflan HFP	1.50	pt	3.50	5	
Staple	0.38	floz	48.23	18	
Caparol	1.50	qt	10.57	16	
Water:					
Water	30.00	acin	5.00	150	
Seed:					
Seed	15.00	lb	1.48	22	
Insecticide:					
Zephyr	6.00	floz	6.00	36	
Warrior	3.20	oz	2.73	9	
Provado	3.75	oz	4.27	16	
Growth Regulator:					
Pix	1.50	pt	15.16	23	
Fertilizer:					
UN32	180.00	lb N	0.26	47	
Defoliant:					
Prep	2.00	pt	6.24	12	
Ginstar	13.00	floz	1.83	24	
Defol 6	1.00	gal	10.00	10	
Gramoxone Max	1.31	pt	5.78	8	
Assessment:					
Cotton Incorporated	2.33	bale	1.00	2	
Cotton Incorporated Supplemental	2.33	bale	1.75	4	
California Ginners and Cotton Growers	2.33	bale	0.15	0	
National Cotton Council	2.33	bale	0.45	1	
Pink Bollworm Project	2.33	bale	2.00	5	
USDA Classing Fee	2.33	bale	1.40	3	
Supima Association	2.33	bale	3.00	7	
Rent:					
Fertilizer Applicator	1.00	acre	2.00	2	
Custom:					
Air Application	7.00	acre	7.50	53	
Gin Compression Charge	2.33	bale	7.00	16	
Gin Charge (Paid by seed credit)	2.33	bale	0.00	0	
Contract:					
PCA/Consultant Fee	1.00	acre	12	12	
Labor (machine)	4.79	hrs	12.74	61	
Labor (non-machine)	10.45	hrs	11.02	115	
Fuel – Diesel	37.22	gal	1.11	41	
Lube				6	
Machinery repair				41	
Interest on operating capital @ 7.14%				25	
TOTAL OPERATING COSTS/ACRE				791	
NET RETURNS ABOVE OPERATING COSTS				244	

UC COOPERATIVE EXTENSION
Table 2. continued

	Value or Cost/Acre	Your Costs
CASH OVERHEAD COSTS:		
Land Rent Cotton	150	
Office Expense	30	
Liability Insurance	1	
Property Taxes	5	
Property Insurance	4	
Investment Repairs	3	
TOTAL CASH OVERHEAD COSTS/ACRE	192	
TOTAL CASH COSTS/ACRE	983	
NON-CASH OVERHEAD COSTS (Capital Recovery)		
Buildings 2,400sqft	3	
Fuel Tanks 2-500 gal	0	
Shop/Field Tools	1	
Siphon Pipes 3"x 90"	1	
Service Truck 2-Ton	10	
Equipment	89	
TOTAL NON-CASH OVERHEAD COSTS/ACRE	104	
TOTAL COSTS/ACRE	1,087	
NET RETURNS ABOVE TOTAL COSTS	-52	

UC COOPERATIVE EXTENSION

Table 3. MONTHLY CASH COSTS PER ACRE to PRODUCE PIMA COTTON

SAN JOAQUIN VALLEY - – 2003

Beginning NOV 02 Ending NOV 03	NOV 02	DEC 02	JAN 03	FEB 03	MAR 03	APR 03	MAY 03	JUN 03	JUL 03	AUG 03	SEP 03	OCT 03	NOV 03	TOTAL
Cultural:														
Rip Fields 1X/3Yrs	11													11
Primary Discing 2X	11													11
Weed: Apply Herbicide	12													12
Incorporate Herbicide	5													5
List Beds	2													2
Make Ditch				1			1		1					2
Irrigate				51				38	77	39				205
Close Ditch				1				1			1			2
Cultivate - 4X					3	3	3	3						11
Plant						25								25
Uncap Beds						2								2
Fertilizer – Sidedress UN32							45							45
Weed Control - Over-The-Top							24							24
Insect Control - Mites							43							43
Weed Control - Hand Hoe								55						55
Weed Control - Direct/Layby								21						21
Insect Control - Lygus								16						16
Insect Control - Aphids									24					24
Apply Growth Regulator 2X									23	15				38
Fertilizer - Water Run UN32									8					8
Defoliate Cotton 2X												69		69
PCA	1	1	1	1	1	1	1	1	1	1	1	1	1	12
Pickup Truck Use	1	1	1	1	1	1	1	1	1	1	1	1		9
TOTAL CULTURAL COSTS	43	2	2	54	4	33	117	136	133	55	2	71	1	653
Harvest:														
Harvest 2X													40	40
Build Module 2X													20	20
Gin Compression Charge													16	16
TOTAL HARVEST COSTS													76	76
Assessment:														
Assessments													23	23
TOTAL ASSESSMENT COSTS													23	23
Postharvest:														
Chop Stalks													3	3
Disc Residue - 2X													11	11
TOTAL POSTHARVEST COSTS													14	14
Interest on operating capital	0	0	0	1	1	1	2	2	3	4	4	4	5	25
TOTAL OPERATING COSTS/ACRE	43	2	2	55	5	33	119	138	136	59	6	74	118	791
TOTAL OPERATING COSTS/LB	0.04	0.00	0.00	0.05	0.00	0.03	0.10	0.12	0.12	0.05	0.01	0.06	0.10	0.69
OVERHEAD:														
Land Rent Cotton													150	150
Office Expense	2	2	2	2	2	2	2	2	2	2	2	2	2	30
Liability Insurance			1											1
Property Taxes			3						3					5
Property Insurance						2						2		4
Investment Repairs	0	0	0	0	0	0	0	0	0	0	0	0		3
TOTAL CASH OVERHEAD COSTS	3	3	6	3	3	4	3	3	5	3	3	4	152	192
TOTAL CASH COSTS/ACRE	46	4	8	57	8	38	121	141	142	61	8	79	152	990
TOTAL CASH COSTS/LB	0.04	0.00	0.01	0.05	0.01	0.03	0.11	0.12	0.12	0.05	0.01	0.07	0.13	0.86

UC COOPERATIVE EXTENSION

Table 4. WHOLE FARM ANNUAL EQUIPMENT, INVESTMENT, and BUSINESS OVERHEAD

SAN JOAQUIN VALLEY – 2003

ANNUAL EQUIPMENT COSTS

					Cash Overhead		
Yr Description	Price	Yrs Life	Salvage Value	Capital Recovery	Insur-ance	Taxes	Total
03 105 hp 2wd Tractor	62,000	10	18,314	7,151	271	402	7,824
03 105 hp 4wd Tractor	75,000	10	22,154	8,650	328	486	9,464
03 150 hp 4wd Tractor	110,000	10	32,492	12,687	482	712	13,881
03 230 hp track-type	154,000	10	45,489	17,761	674	997	19,433
03 Cultivator Rolling 20' #1	6,800	5	2,215	1,234	30	45	1,310
03 Cultivator Rolling 20' #2	6,800	5	2,215	1,234	30	45	1,310
03 Disc - Finish 21'	19,595	12	2,714	2,211	75	112	2,398
03 Disc-Stubble 18' #1	42,000	10	7,427	5,217	167	247	5,632
03 Disc-Stubble 18' #2	42,000	10	7,427	5,217	167	247	5,632
03 Ditcher - 8'	7,800	15	749	785	29	43	856
03 Harvester 4-Row #1	265,000	10	49,987	32,684	1,065	1,575	35,324
03 Harvester 4-Row #2	265,000	10	49,987	32,684	1,065	1,575	35,324
03 Lister 6 Row 20'	5,500	12	762	621	21	31	673
03 Module Builder #1	24,000	10	4,244	2,981	95	141	3,218
03 Module Builder #2	24,000	10	4,244	2,981	95	141	3,218
03 Mower-Flail 20'	14,445	15	1,387	1,453	54	79	1,586
03 Pickup - 1/2 Ton	24,000	5	10,756	3,838	117	174	4,129
03 Pickup - 3/4 Ton	28,000	5	12,549	4,477	137	203	4,817
03 Planter-6 Row 20'	15,015	15	1,442	1,511	56	82	1,648
03 Rear Blade - 10'	2,581	18	172	237	9	14	261
03 Saddle Tank 300gal #1	3,218	5	1,048	584	14	21	620
03 Saddle Tank 300gal #2	3,218	5	1,048	584	14	21	620
03 Spray Boom 20' #1	913	3	380	224	4	6	235
03 Spray Boom 20' #2	913	3	380	224	4	6	235
03 Subsoiler 10'	14,800	10	2,617	1,838	59	87	1,984
03 Uncapper-6 row 20'	8,500	10	1,503	1,056	34	50	1,140
TOTAL	1,225,098		283,702	150,127	5,100	7,544	162,770
60% of New Cost *	735,059		170,221	90,076	3,060	4,526	97,662

ANNUAL INVESTMENT COSTS

					Cash Overhead			
Description	Price	Yrs Life	Salvage Value	Capital Recovery	Insur-ance	Taxes	Repairs	Total
Buildings 2,400 sqft	60,000	30		4,476	203	300	1,200	6,179
Fuel Tanks 2-500 gal	6,514	20	651	562	24	36	130	752
Service Truck 2-Ton	125,500	10	25,000	15,379	509	752	2,510	19,151
Shop/Field Tools	12,000	15	1,200	1,205	45	66	240	1,556
Siphon Pipes 200 3"x 90"	8,024	10		1,103	27	40	160	1,330
TOTAL INVESTMENT	212,038		26,851	22,726	807	1,194	4,240	28,968

ANNUAL BUSINESS OVERHEAD COSTS

Description	Units/ Farm	Unit	Price/ Unit	Total Cost
Land Rent Cotton	750	acre	150.00	112,500
Liability Insurance	1,500	acre	0.83	1,246
Office Expense	1,500	acre	30.00	45,000

UC COOPERATIVE EXTENSION

Table 5 HOURLY EQUIPMENT COSTS

SAN JOAQUIN VALLEY - SOUTH 2002

			COSTS PER HOUR					
			Cash Overhead		Operating			
Yr	Description	Actual Hours Used	Capital Recovery	Insur-ance	Taxes	Repairs	Fuel & Lube	Total Oper.	Total Costs/Hr.
03	105 hp 2wd Tractor	1,343.60	3.19	0.12	0.18	2.81	7.78	10.59	14.09
03	105 hp 4wd Tractor	1,599.60	2.34	0.12	0.18	1.94	7.78	9.72	13.27
03	150 hp 4wd Tractor	1,730.90	4.40	0.17	0.25	2.86	11.11	13.97	18.78
03	230 hp track-type	1,600.20	6.66	0.25	0.37	4.00	17.04	21.04	28.32
03	Cultivator Rolling 20' #1	231.80	3.20	0.08	0.12	0.65	0.00	0.65	4.05
03	Cultivator Rolling 20' #2	154.50	4.43	0.11	0.16	0.65	0.00	0.65	5.35
03	Disc - Finish 21'	273.20	4.85	0.16	0.24	3.11	0.00	3.11	8.37
03	Disc-Stubble 18' #1	199.50	15.69	0.50	0.74	6.79	0.00	6.79	23.73
03	Disc-Stubble 18' #2	200.00	15.65	0.50	0.74	6.79	0.00	6.79	23.69
03	Ditcher - 8'	130.00	3.62	0.13	0.20	1.19	0.00	1.19	5.14
03	Harvester 4-Row #1	207.10	94.70	3.08	4.56	38.51	19.26	57.77	160.13
03	Harvester 4-Row #2	207.10	94.70	3.08	4.56	38.51	19.26	57.77	160.13
03	Lister 6 Row 20'	165.70	2.25	0.08	0.11	1.10	0.00	1.10	3.54
03	Module Builder #1	263.20	6.80	0.22	0.32	3.25	0.00	3.25	10.59
03	Module Builder #2	113.20	15.80	0.51	0.75	3.25	0.00	3.25	20.30
03	Mower-Flail 20'	130.20	6.69	0.25	0.36	6.33	0.00	6.33	13.64
03	Pickup - 1/2 Ton	399.60	5.76	0.18	0.26	1.78	2.55	4.33	10.53
03	Pickup - 3/4 Ton	399.60	6.72	0.21	0.30	2.08	2.55	4.63	11.86
03	Planter-6 Row 20'	132.70	6.83	0.25	0.37	2.96	0.00	2.96	10.41
03	Rear Blade - 10'	160.00	0.89	0.03	0.05	0.37	0.00	0.37	1.35
03	Saddle Tank 300gal #1	400.00	0.88	0.02	0.03	0.02	0.00	0.02	0.95
03	Saddle Tank 300gal #2	400.00	0.88	0.02	0.03	0.02	0.00	0.02	0.95
03	Spray Boom 20' #1	500.00	0.27	0.01	0.01	0.25	0.00	0.25	0.53
03	Spray Boom 20' #2	500.00	0.27	0.01	0.01	0.25	0.00	0.25	0.53
03	Subsoiler 10'	200.00	5.52	0.18	0.26	3.34	0.00	3.34	9.29
03	Uncapper-6 row 20'	60.70	10.43	0.33	0.49	1.73	0.00	1.73	12.98

UC COOPERATIVE EXTENSION

Table 6. RANGING ANALYSIS

SAN JOAQUIN VALLEY - 2003

COSTS PER ACRE AT VARYING YIELD TO PRODUCE PIMA COTTON

	YIELD (lbs lint/acre)							
	750	1,000	**1,150**	1,250	1,500	1,750	2,000	2,250
OPERATING COSTS/ACRE								
Cultural Cost	653	653	653	653	653	653	653	653
Harvest Cost	41	52	60	64	76	88	100	112
Assessment Cost	15	20	23	25	30	35	40	44
Ginning/Compression Cost	11	14	16	18	21	25	28	32
Postharvest Cost	14	14	14	14	14	14	14	14
Interest on operating capital	25	25	25	25	25	25	26	26
TOTAL OPERATING COSTS/ACRE	759	778	791	799	819	840	861	881
TOTAL OPERATING COSTS/LB	1.01	0.78	0.69	0.64	0.55	0.48	0.43	0.39
CASH OVERHEAD COSTS/ACRE	192	192	192	192	192	192	192	192
TOTAL CASH COSTS/ACRE	951	970	983	991	1,011	1,032	1,053	1,073
TOTAL CASH COSTS/LB	1.27	0.97	0.85	0.79	0.67	0.59	0.53	0.48
NON-CASH OVERHEAD COSTS/ACRE	104	104	104	105	105	105	105	105
TOTAL COSTS/ACRE	1,055	1,074	1,087	1,096	1,116	1,137	1,158	1,178
TOTAL COSTS/LB	1.41	1.07	0.95	0.88	0.74	0.65	0.58	0.52

UC COOPERATIVE EXTENSION
Table 6. continued

NET RETURNS PER ACRE ABOVE OPERATING COSTS FOR PIMA COTTON

PRICE ($/lb)	YIELD (lbs lint/acre)							
Lint	750	1,000	**1,150**	1,250	1,500	1,750	2,000	2,250
0.70	-234	-78	27	76	231	385	539	694
0.75	-197	-28	85	139	306	473	639	807
0.80	-159	22	142	201	381	560	739	919
0.85	-122	72	200	264	456	648	839	1,032
0.90	-84	122	257	326	531	735	939	1,144
0.95	-47	172	315	389	606	823	1,039	1,257
1.00	-9	222	372	451	681	910	1,139	1,369

NET RETURNS PER ACRE ABOVE CASH COST FOR PIMA COTTON

PRICE ($/lb)	YIELD (lbs lint/acre)							
Lint	750	1,000	**1,150**	1,250	1,500	1,750	2,000	2,250
0.70	-426	-270	-165	-116	39	193	347	502
0.75	-389	-220	-108	-54	114	281	447	615
0.80	-351	-170	-50	9	189	368	547	727
0.85	-314	-120	8	72	264	456	647	840
0.90	-276	-70	65	134	339	543	747	952
0.95	-239	-20	123	197	414	631	847	1,065
1.00	-201	30	180	259	489	718	947	1,177

NET RETURNS PER ACRE ABOVE TOTAL COST FOR PIMA COTTON

PRICE ($/lb)	YIELD (lbs lint/acre)							
Lint	750	1,000	**1,150**	1,250	1,500	1,750	2,000	2,250
0.70	-530	-374	-269	-221	-66	88	242	397
0.75	-493	-324	-212	-159	9	176	342	510
0.80	-455	-274	-154	-96	84	263	442	622
0.85	-418	-224	-97	-34	159	351	542	735
0.90	-380	-174	-39	29	234	438	642	847
0.95	-343	-124	19	92	309	526	742	960
1.00	-305	-74	76	154	384	613	842	1,072

Lint Price when comparing to other cotton studies = Lint + LDP
Bold = data in study