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1997

UNIVERSITY OF CALIFORNIA COOPERATIVE EXTENSION

**PRODUCTION PRACTICES  
AND SAMPLE COSTS TO PRODUCE**



~ *COTTON* ~

**PALO VERDE VALLEY  
RIVERSIDE COUNTY**

By

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# University of California Cooperative Extension

## Sample Costs To Produce Cotton Riverside County - 1997

### INTRODUCTION

Detailed costs to produce Cotton in Palo Verde Valley, Riverside County, California are presented in this study. The hypothetical farm used in this report consists of 1800 acres of which 450 acres are in cotton production.

This study consists of General Assumptions for Producing Cotton along with six tables of cost analysis. The practices described in this study are considered typical for cotton production in the Palo Verde Valley of Riverside County. They do not reflect the exact values or practices of any grower or shipper, but are rather an amalgamation of costs and practices in the region. Sample costs given for labor, materials, equipment and contract services are based on 1997 prices. Some costs and practices detailed in this study may not be applicable to every situation. The intent of this guide is to help cotton growers make production decisions, determine potential returns, prepare budgets and evaluate production loans.

Costs are presented in six 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 Equipment List, Prices, Annual Investment And Business Overhead Costs**
- Table 5. **Whole Farm Hourly Equipment Costs**
- Table 6. **Ranging Analysis Of Costs And Returns To Produce Cotton**

A blank column, “*Your Costs*”, is provided to enter your actual costs on **Tables 1 (Costs Per Acre To Produce Cotton )** and **2 (Costs And Returns Per Acre To Produce Cotton )**.

For an explanation of calculations used in the study refer to the attached General Assumptions, call Etaferahu Takele, Area Farm Management Economics Advisor, Riverside County Cooperative Extension, (909) 683-6491 ext. 243 or call Robert Kallenbach, Farm Advisor in the Palo Verde Valley of Riverside County, (760) 921-7884.

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## ASSUMPTIONS USED IN THIS STUDY

The following is a description of the assumptions used in this study to develop costs for production of cotton in the Palo Verde Valley of Riverside County in 1997.

### 1. LAND RENT

This report is based on a 1800 acre farm, 450 acres are for cotton production. Other crops grown on this farm include vegetable crops, wheat and alfalfa hay.

It is common for farmers in the Palo Verde Valley to both own and rent farmland. The price for purchasing farmland in the region is approximately \$3600 per acre. Rental contracts and charges for land suitable for cotton production do not range widely in the Palo Verde Valley. Land in the area leases on a cash rent basis at about \$170 per acre per year. In this study, it is assumed that all acreage is rented.

Many crops are grown in rotation with cotton including alfalfa, wheat, melons, and iceberg lettuce. Some of these rotations take advantage of the partial growing season before or after cotton. As a result, these rotations lower the annual land cost or leasing rate accordingly. On our hypothetical farm, it is assumed that all of the 450 acres of cotton will be rotated to wheat production in the late autumn. This will give the farm an annual productive acreage of 2250 acres and a leasing rate of \$136 per acre.

### 2. CULTURAL PRACTICES AND PRODUCTION INPUTS

**Land Preparation:** Primary tillage and planting groundwork operations which include plowing, stubble discing, discing, and listing beds are performed from January to early February. A D-8 crawler is used to perform pre-plant subsoiling. Most other tillage operations would require a 120 hp to 150 hp 2-wheel drive tractor.

Beginning in January the acreage intended for cotton production is subsoiled. Next the ground is disced two times to prepare the soil for planting. The soil is disced across the previous crop rows to assure good aeration of the soil, adequate burial of organic matter, and control of pests and diseases.

The soil is then listed and shaped into 40" beds before planting. Land preparation practices sometimes include laser leveling or using a landplane to improve drainage and irrigation efficiency of the soil. However, laser leveling is not typically performed for cotton production.

**Stand Establishment:** The ideal time to plant cotton in the Palo Verde Valley is in early March for the fall harvest between September and October.

Seeding rates will vary depending on variety, time of planting and grower preferences. In this study, we used 14.5 pounds of seed per acre planted in 40 inch beds. Until a few years ago, DPL 5415 and DPL 20 were nearly standard varieties for the area. Genetically engineered cotton varieties such as NuCOTN 33<sup>B</sup> are rapidly displacing these older varieties.

Genetic engineering has produced two new "types" of cotton. A natural insecticide known as *Bacillus thuringiensis* (Bt) has been genetically incorporated into several varieties of cotton. Bt is a bacteria that

inhibits the larval attack of lepidopterous insects such as Pink Bollworm, Budworm and Cotton Bollworm. Within hours of contact with the Bt, the larvae will cease eating and die within days. The Bt protects the cotton plant as its boll opens and the plants' fruiting body starts to mature. This is when the larvae of the insects are most likely to attack the plant. NuCOTN 33<sup>B</sup> is an example of Bt cotton.

Genetic engineering has also produced cotton varieties that are resistant to Glyphosate (Roundup). This advancement allows growers to use a non-selective herbicide to eliminate persistent weeds without damaging the cotton. In this analysis, we assumed NuCOTN 33<sup>B</sup> (without the Roundup-Ready gene) was planted .

**Weed Management:** Principal targeted weeds from year to year include the various grasses and broadleaf weeds common to the Palo Verde Valley. Many growers incorporate a preplant herbicide into their cultural practices. In this study, only a post-plant application of Treflan on Bt cotton is used as a lay-by herbicide treatment. Mechanical cultivations are also used to control inter-bed weed formations during the growing season.

Spot treatments for weeds, particularly nutsedge with MSMA are done on an as-needed basis throughout the growing season. Usually, between 5% to 10% of the cotton stand is treated for nutsedge. It should also be noted that if cotton is planted in a field after an alfalfa crop, there is a greater likelihood of costly weed infestation. This will require the use of labor crews to hand-weed the cotton fields.

Many growers take preventive steps to ensure a good crop. In this study, a soil analysis is done in February prior to planting to examine soil nutritive value and fertility. Additionally, the field should be checked during the growing period to ensure that pest management guidelines are being followed and to diagnose any potential threats to the crop.

**Fertilization:** In this study, an application of 10-34 starter fertilizer is applied during stand establishment. The fertilizer is applied during planting directly in the seed line. During the growing period, ammonium nitrate (NH<sub>3</sub>) is applied two times. Typically, NH<sub>3</sub> is applied as part of a liquid mixture at a rate of 75 pounds per application and is directly injected into the cotton beds or added to an irrigation application.

**Irrigation:** The cotton field is routinely pre-irrigated prior to planting. Cotton is irrigated via furrows, which allows for uniform application of water. Water is obtained through the Palo Verde Valley Irrigation District. The total application of water is approximately 4.5 acre feet per growing period. The total cost of water is \$42 per acre.

**Pest Management:** Pink Bollworm and Silverleaf Whitefly are major threats to cotton in the Palo Verde Valley. Pink Bollworm is susceptible to Bt cotton. However, control of the Silverleaf Whitefly will require frequent spraying. Spraying for both Pink Bollworm and Silverleaf Whitefly takes place at the pin square stage of cotton plant development. Many Pest Control Advisors (PCA's) feel that a spraying helps to prevent the Pink Bollworm from becoming resistant to the Bt cotton. A preferred treatment is a foliar application of Lorsban. In this study, Lorsban is applied at a rate of 1 pint per acre.

Starting in 1997 Insect Growth Regulators (IGR) have been approved for use on the Silverleaf Whitefly in California. This product has been used with success against the Silverleaf Whitefly in neighboring Arizona. Some growers in the Palo Verde Valley feel that IGR are too expensive at present time to incorporate into a regular pest management program.

Other important insects that can affect cotton during the growing period include the Cotton Bollworm, Lygus and Plant Bugs which should all be controlled by the Bt cotton plant. Bt cotton has been developed, in part, to decrease the use of chemicals in cotton production. But farmers should realize that applications of chemicals to keep insect populations below infestation thresholds may be needed on occasion. Cotton plants need to be regularly checked to ascertain pest levels and to determine the proper course of action to be taken. If you have a specific insect problem, consult a licensed pest control advisor. Chemicals which may be legally used to control these insect pests are subject to change frequently. Current information is imperative before treating a field.

**Disease Management:** Depending on the region, a number of diseases may infect cotton during any phase of growth. In the Palo Verde Valley the most common diseases affecting cotton are various fungal diseases. These diseases occur primarily on cotton seedlings. Treatments can vary for each disease. Consult with the University of California Cooperative Extension (UCCE) Farm Advisor or your PCA before commencing a treatment regime.

**Growth Regulators & Defoliation:** Growth regulators cause the plant to switch from vegetative growth to boll maturation. This leads to more boll uniformity and helps mechanical harvest. A mix of growth regulators, Pix (*Mepiquat Chloride*), applied at approximately 2 pints per acre, and Prep (*Ethephon*), applied at 2 gallon per acre, are used in this study.

Defoliant is applied prior to picking to aid harvest by causing the leaves to drop off. Defoliation eases mechanical picking and diminishes staining of bolls 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. In this study, Dropp, a defoliant is applied in September for a first-set harvest in early October.

The pesticides and rates mentioned in this cost study are a few of those that are listed in *UC Pest Management Guidelines*. In this study, no disease treatment was included. Written recommendations, made by State of California licensed pest control advisors, are required for pesticides. For information and pesticide use permits, contact the local county Agricultural Commissioner's office. Contact the UCCE Riverside County farm advisor for additional production information.

### **3. HARVESTING AND POSTHARVEST HANDLING.**

Cotton is harvested in early fall, 14 to 21 days after defoliant has been applied to the cotton crop. Some growers try to grow a second set of cotton to be harvested later in the fall. Growers will either hire a custom harvester or harvest the crop themselves.

Farmers that use custom harvesters are charged a fee based on the cotton yield. Depending on the agreement between the grower and the harvester, custom harvest charges are based on either yield of seed cotton (yield of lint and seed together) or on a yield of lint only. In this study, harvest rates include \$3.30 per 100 pounds of seed cotton and \$0.10 per lb. of lint cotton. Using the yield figures from this

study (a yield of 1320 lbs. per acre of cotton lint and 1850 lbs. per acre of cotton seed ), growers would pay \$105 per acre to have their acreage custom harvested if based on seed cotton yield or \$132 per acre if based on lint yield.

Many cotton farmers in the Palo Verde Valley harvest their own cotton crop. Therefore, in this study it is assumed that the grower owns the harvesters and does the harvesting. Costs for harvest operations are shown in **Tables 1** and **3**.

Ginning costs for cotton are \$95 per acre. This cost is deducted from growers income for cotton seed. Additionally, any assessments that are charged to the cotton farmer are deducted at the ginning house from the gross income of the grower.

After the cotton is harvested, the remaining cotton stalks are mowed using a flail chopper and the soil is disced two times in preparation for the next crop. In the Palo Verde Valley, either wheat, alfalfa or spring vegetables are commonly planted following a cotton crop.

#### **4. YIELDS & RETURNS**

**Yields:** In any given year yields vary considerably. Cotton crop yields in the Palo Verde Valley from 1990 to 1995 are shown to range from approximately 815 to 1400 pounds of cotton lint and 1600 to 2380 pounds of cotton seed per acre (**Table A**). In this study, a yield of 1375 pounds (2.75 bales) of cotton lint and 1925 pounds (0.96 tons) of cotton seed per acre is used.

**Table A. Cotton Lint & Cotton Seed Yields,  
(Weighted Average of Short and Long Staple),  
Palo Verde Valley, Riverside County 1990 - 1995<sup>1</sup>**

Year	Cotton Lint Bales per Acre	Cotton Lint Pounds per Acre	Cotton Seed Pounds per Acre
1990	1.69	845.00	1400
1991	2.20	1100.00	1740
1992	2.05	1025.00	1620
1993	2.77	1385.00	2200
1994	2.90	1450.00	2380
1995	1.99	995.00	1600
Average	2.27	1133.00	1820

1) Riverside County Agricultural Production Report, 1990 - 1995

**Returns:** The market for cotton is volatile. Growers market their crop through their local cotton gin. We used the six year average price of \$0.69 per pound for cotton lint and \$0.061 per pound of cotton seed as the basis for our analysis. However, to cover a broader scenario of productivity and prices, we analyzed returns at various yields and prices (**Table 6**).

**Table B. Cotton Lint & Cotton Seed Prices,  
(Weighted Average of Short and Long Staple),  
Palo Verde Valley, Riverside County 1990 - 1995 <sup>2</sup>**

Year	Price Per Pound Cotton Lint	Price Per Pound of Cotton Seed
1990	0.71	0.068
1991	0.61	0.055
1992	0.52	0.060
1993	0.58	0.060
1994	0.75	0.060
1995	0.80	0.060
Average	0.66	0.061

2) Riverside County Agricultural Production Report, 1990 - 1995

This study does not include the role government support programs and the commodity markets play in determining the price of cotton and income derived from them, nor how they would affect the cultural practices of a farmer.

## **5. ASSESSMENTS**

**USDA-HVI:** Cotton growers are assessed several fees for different organizations and purposes. The USDA levies a fee for High Volume Instrumentation (HVI) for classifying cotton grades. Growers are mandated to pay \$2.00 per bale of cotton.

**Cotton Inc.:** 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 \$2.70 per bale.

**Pink Bollworm Project:** The California State Department of Food and Agriculture (CDFA) manages and enforces the Pink Bollworm Project. This program, and legislated postharvest practices, controls pink bollworm in the various cotton growing districts within 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. Growers are charged \$2.00 per bale to fund this 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 \$1.25 per bale.

**California Cotton Growers And Ginners Association:** Regionally, the California Cotton Growers And Ginners Association assists California cotton growers in advocating their position in the legislature and charges \$0.14 per bale. Participation in this organization is voluntary.

## **6. RISK**

The risks associated with cotton production should be noted. 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.

Risk is caused by various sources of uncertainty which include production, price, and financing. Examples of these risks are insect damage, a decrease in price, and an increase in interest rates. Because of the risk involved, access to information on production practices, prices, and markets is crucial.

## **7. LABOR**

Basic hourly wages for workers are \$6.50 per hour for machine operators and \$5.25 per hour for non-machine workers. Growers also pay for benefits including, Workers Compensation, Social Security, Medicare insurance and other possible benefits. In this study, growers surveyed showed that benefits increased labor wages by 42%. This brings the labor rate to \$9.23 per hour for machine operators and \$7.46 for non-machine workers. The labor for operations involving machinery are 20% higher than the operation time to account for the extra labor involved in equipment set up, moving, maintenance and repair.

## **8. 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 equipment repairs.

**Property Taxes:** Counties charge a base property tax rate of 1% on the assessed value of the property. In some counties special assessment districts exist and charge additional taxes on property including equipment, buildings, and improvements. For this study, county taxes are calculated as 1% of the average value of the property. Average value equals new cost plus salvage value divided by 2 on a per acre basis.

**Interest On Operating Capital:** Interest on operating capital is based on cash operating costs and is calculated monthly until harvest at a nominal rate of 11.61% per year. A nominal interest rate is the going market cost of borrowed funds during the production year.

**Insurance:** Insurance for farm investments vary depending on the assets included and the amount of coverage. Property insurance provides coverage for property loss and is charged at 0.713% of the average value of the assets over their useful life. Liability insurance covers accidents on the farm and costs \$35.00 per cropped acre.

**Management Fee:** A fee for management is included to indicate that a cash cost for professional supervision of the farm is incurred. If the manager is also the owner, a salary would be paid regardless of any profits received from cotton production. In this study, a management fee of \$50.00 per acre per year is used.

**Office Expenses:** Office and business expenses are estimated at \$50.00 per acre. These expenses include office supplies, telephone, bookkeeping, accounting, legal fees, road maintenance, etc. Cash overhead costs are found in **Tables 1, 2, 3, and 4.**

## **9. NON-CASH OVERHEAD**

Non-cash overhead is comprised of depreciation and interest charged on equipment and other investments. Typically farm equipment in the Palo Verde Valley is purchased used. In this study, the current purchase price for new equipment is reduced by 40% to indicate a mix of new and used equipment. Annual equipment and investment costs are shown in **Tables 1** and **4**. They represent the per acre depreciation and interest costs for each investment on an annual basis.

**Depreciation:** Depreciation is a reduction in market value of investments due to wear, obsolescence, and age, and is on a straight line basis. Annual depreciation is calculated as purchase price minus salvage value divided by years of ownership of the investment. The purchase price and years of life are shown in **Table 4**.

**Interest On Investment:** Interest is charged on investments to account for income foregone (opportunity cost) that could be received from an alternative investment. The investments are assumed to be owned outright. Therefore, interest on investments is a non-cash cost. Investments include buildings and equipment. Interest is calculated as the average value of the investment during its useful life, multiplied by 3.72% per year.

Average value for equipment and buildings equals new cost plus salvage value divided by 2. The interest rate used to calculate opportunity cost is the average of the agricultural sector long-run rate of return to production assets.

## **10. EQUIPMENT CASH COSTS**

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 fuel, lubrication, and repairs.

In allocating the equipment costs on a per acre basis, hourly charges are calculated first and shown in **Table 5**. 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 1** is determined by multiplying the total hourly operating cost in **Table 5** for each piece of equipment by the number of hours per acre for that operation. Tractor time is 10% higher than implement time for a given operation to account for setup time. Prices for on-farm delivery of diesel is \$0.95 (off-road, no tax) and gasoline is \$1.40 per gallon.

## **ADDENDUM**

1. Due to rounding, totals may be slightly different from the sum of components.
2. The per acre equipment costs in Table 1 reflect both the value and the level of use (hours and years of use) of the machinery complement. Therefore this cost could be different from the per acre value of the machinery complement in Table 4.
3. 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.

## ACKNOWLEDGMENT

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Table 1.

COSTS PER ACRE TO PRODUCE COTTON  
PALO VERDE VALLEY, RIVERSIDE COUNTY

Labor Rate: \$ 9.23/hr. machine labor      Interest Rate: 11.61%  
 \$ 7.46/hr. non-machine labor      Yield per Acre: 1375.00 lb. lint, 1925.00 lb. seed

Operation	Cash and Labor Costs per Acre						Total Cost	Your Cost
	Operation Time (Hrs/A)	Labor Cost	Fuel, Lube & Repairs	Material Cost	Custom/Rent	Total Cost		
<b>Preplant:</b>								
Subsoil	0.67	7	19	0	0		27	
Disc 2x's	0.50	6	9	0	0		15	
List	0.20	2	3	0	0		5	
Soil Test	0.00	0	0	0	1		1	
Cultivate	0.14	2	2	0	0		3	
Pre-Irrigate	<u>0.50</u>	<u>4</u>	<u>0</u>	<u>5</u>	<u>0</u>		<u>8</u>	
<b>TOTAL PREPLANT COSTS</b>	<b>2.01</b>	<b>20</b>	<b>34</b>	<b>5</b>	<b>1</b>		<b>60</b>	
<b>Cultural:</b>								
Plant	0.22	2	4	43	0		49	
Bt Technology Fee	0.00	0	0	0	33		33	
Cultivate	0.28	3	4	0	0		7	
Irrigate	4.00	30	0	37	0		67	
Fertilizer	0.77	9	14	21	0		43	
Spot Spray Herbicide	0.16	2	3	12	0		16	
Cotton Growth Regulator	0.49	5	8	22	0		35	
Insecticide	0.20	2	3	6	0		12	
Lay By Herbicide	0.16	2	3	7	0		11	
Defoliate	0.25	3	3	27	0		33	
Pick Up Truck	<u>0.78</u>	<u>9</u>	<u>5</u>	<u>0</u>	<u>0</u>		<u>13</u>	
<b>TOTAL CULTURAL COSTS</b>	<b>7.32</b>	<b>67</b>	<b>45</b>	<b>174</b>	<b>33</b>		<b>319</b>	
<b>Harvest:</b>								
Harvest	<u>0.33</u>	<u>4</u>	<u>18</u>	<u>21</u>	<u>0</u>		<u>42</u>	
<b>TOTAL HARVEST COSTS</b>	<b>0.33</b>	<b>4</b>	<b>18</b>	<b>21</b>	<b>0</b>		<b>42</b>	
<b>Assessment:</b>								
Assessments	<u>0.00</u>	<u>0</u>	<u>0</u>	<u>22</u>	<u>0</u>		<u>22</u>	
<b>TOTAL ASSESSMENT COSTS</b>	<b>0.00</b>	<b>0</b>	<b>0</b>	<b>22</b>	<b>0</b>		<b>22</b>	
<b>Postharvest:</b>								
Flail Chopper	0.20	2	3	0	0		5	
Disc 2x's - Stubble Disc	<u>0.50</u>	<u>6</u>	<u>9</u>	<u>0</u>	<u>0</u>		<u>14</u>	
<b>TOTAL POSTHARVEST COSTS</b>	<b>0.70</b>	<b>8</b>	<b>12</b>	<b>0</b>	<b>0</b>		<b>20</b>	
Interest on operating capital @ 11.61%								24
<b>TOTAL OPERATING COSTS/ACRE</b>		<b>98</b>	<b>109</b>	<b>222</b>	<b>33</b>		<b>487</b>	
<b>TOTAL OPERATING COSTS/LB</b>								<b>0.35</b>

Table 1. CONTINUED

COSTS PER ACRE TO PRODUCE COTTON  
PALO VERDE VALLEY, RIVERSIDE COUNTY

Labor Rate: \$ 9.23/hr. machine labor Interest Rate: 11.61%  
\$ 7.46/hr. non-machine labor Yield per Acre: 1375.00 lb. lint, 1925.00 lb. seed

				Total Cost	Your Cost
<b>CASH OVERHEAD:</b>					
Land Rent				136	
Office Expense				50	
Management Fee				50	
Liability Insurance				35	
Property Taxes				3	
Property Insurance				2	
Investment Repairs				1	
<b>TOTAL CASH OVERHEAD COSTS</b>				<b>276</b>	
<b>TOTAL CASH COSTS/ACRE</b>				<b>763</b>	
<b>TOTAL CASH COSTS/LB</b>				<b>0.56</b>	
<b>NON-CASH OVERHEAD:</b>					
	Per producing Acre	----- Depreciation	Annual Cost ----- Interest @ 3.72%		
Investment					
-----	-----	-----	-----		
Shop Building	6	0	0	0	
Shop Tools	6	0	0	0	
Fuel Tanks & Pumps	17	1	0	1	
Equipment	485	59	10	69	
<b>TOTAL NON-CASH OVERHEAD COSTS</b>				<b>71</b>	
<b>TOTAL COSTS/ACRE</b>				<b>834</b>	
<b>TOTAL COSTS/LB</b>				<b>0.61</b>	

Table 2.

COSTS AND RETURNS PER ACRE TO PRODUCE COTTON  
PALO VERDE VALLEY, RIVERSIDE COUNTY

Labor Rate:\$ 9.23/hr. machine labor \$ 7.46/hr. non-machine labor Interest Rate: 11.61%					
	Quantity/Acre	Unit	Price or Cost/Unit	Value or Cost/Acre	Your Cost
<b>GROSS RETURNS</b>					
Lint	1375.00	Lb	0.66	907	
Seed	1925.00	Lb	0.061	117	
Ginning	1.00	Acre	-95.00	-95	
				-----	
<b>TOTAL GROSS RETURNS FOR COTTON</b>				<b>930</b>	
<b>OPERATING COSTS</b>					
Custom:					
Soil Test	1.00	Acre	1.00	1	
Water:					
Water	54.00	AcIn	0.78	42	
Seed:					
NuCOTN 33B Cotton Seed	14.50	Lb	0.86	12	
Insecticide:					
Temik	4.25	Lb	3.74	16	
Lorsban 4	1.00	Pint	6.38	6	
Fungicide:					
Ridomil	0.50	Pint	22.54	11	
Fertilizer:					
10-34 Fertilizer	22.00	Lb	0.139	3	
NH3	150.00	Lbs	0.139	21	
Contract:					
Technology Fee	1.00	Acre	32.50	33	
Herbicide:					
MSMA	0.33	Gal	19.76	7	
Treflan Liquid	1.25	Pint	5.25	7	
Surfactant:					
Green-Up	48.00	Oz	0.11	5	
Growth Regulator:					
Pix	24.00	Oz	0.909	22	
Prep	0.33	Pint	6.05	2	
Defoliant:					
Dropp	0.40	Lb	62.10	25	
Harvest:					
Hauling Charge	2.75	Bale	7.50	21	

Table 2.CONTINUED

COSTS AND RETURNS PER ACRE TO PRODUCE COTTON  
PALO VERDE VALLEY, RIVERSIDE COUNTY

Labor Rate:\$ 9.23/hr. machine labor \$ 7.46/hr. non-machine labor Interest Rate: 11.61%					
	Quantity/Acre	Unit	Price or Cost/Unit	Value or Cost/Acre	Your Cost
<b>Assessment:</b>					
USDA - HVI	2.75	Bale	2.00	6	
CDFA Pink Bollworm	2.75	Bale	2.00	6	
Cotton Inc.	2.75	Bale	2.70	7	
Nat. Cotton Council	2.75	Bale	1.25	3	
CCCGA	2.75	Bale	0.188	1	
Labor (machine)	7.02	hrs	9.23	65	
Labor (non-machine)	4.50	hrs	7.46	34	
Fuel - Gas	1.56	gal	1.40	2	
Fuel - Diesel	52.91	gal	0.95	50	
Lube				8	
Machinery repair				49	
Interest on operating capital @ 11.61%				24	
<b>TOTAL OPERATING COSTS/ACRE</b>				<b>487</b>	
<b>TOTAL OPERATING COSTS/LB</b>				<b>0.35</b>	
<b>NET RETURNS ABOVE OPERATING COSTS</b>				<b>443</b>	
<b>CASH OVERHEAD COSTS:</b>					
Land Rent				136	
Office Expense				50	
Management Fee				50	
Liability Insurance				35	
Property Taxes				3	
Property Insurance				2	
Investment Repairs				1	
<b>TOTAL CASH OVERHEAD COSTS/ACRE</b>				<b>276</b>	
<b>TOTAL CASH COSTS/ACRE</b>				<b>763</b>	
<b>TOTAL CASH COSTS/LB</b>				<b>0.56</b>	
<b>NON-CASH OVERHEAD COSTS (DEPRECIATION &amp; INTEREST):</b>					
Shop Building				0	
Shop Tools				0	
Fuel Tanks & Pumps				1	
Equipment				69	
<b>TOTAL NON-CASH OVERHEAD COSTS/ACRE</b>				<b>71</b>	
<b>TOTAL COSTS/ACRE</b>				<b>834</b>	
<b>TOTAL COSTS/LB</b>				<b>0.61</b>	
<b>NET RETURNS ABOVE TOTAL COSTS</b>				<b>96</b>	

Table 3.

MONTHLY CASH COSTS PER ACRE TO PRODUCE COTTON  
PALO VERDE VALLEY, RIVERSIDE COUNTY

Beginning JAN 97 Ending DEC 97	JAN 97	FEB 97	MAR 97	APR 97	MAY 97	JUN 97	JUL 97	AUG 97	SEP 97	OCT 97	NOV 97	DEC 97	TOTAL
<b>Preplant:</b>													
Subsoil	27												27
Disc 2x's	15												15
List		5											5
Soil Test		1											1
Cultivate		3											3
Pre-Irrigate		<u>8</u>											<u>8</u>
<b>TOTAL PREPLANT COSTS</b>	<b>42</b>	<b>18</b>											<b>60</b>
<b>Cultural:</b>													
Plant			49										49
Bt Technology Fee			33										33
Cultivate			3	3									7
Irrigate				8		17	17	25					67
Fertilizer				22	22								43
Spot Spray Herbicide				16									16
Cotton Growth Regulator					17	18							35
Insecticide					12								12
Lay By Herbicide						11							11
Defoliate									33				33
Pick Up Truck	1	1	1	1	1	1	1	1	1	1	1	1	13
<b>TOTAL CULTURAL COSTS</b>	<b>1</b>	<b>1</b>	<b>86</b>	<b>51</b>	<b>52</b>	<b>47</b>	<b>18</b>	<b>26</b>	<b>34</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>319</b>
<b>Harvest:</b>													
Harvest										<u>42</u>			<u>42</u>
<b>TOTAL HARVEST COSTS</b>										<b>42</b>			<b>42</b>
<b>Assessment:</b>													
Assessments										<u>22</u>			<u>22</u>
<b>TOTAL ASSESSMENT COSTS</b>										<b>22</b>			<b>22</b>
<b>Postharvest:</b>													
Flail Chopper										5			5
Disc 2x's - Stubble Disc										<u>14</u>			<u>14</u>
<b>TOTAL POSTHARVEST COSTS</b>										<b>20</b>			<b>20</b>
Interest on oper. capital	0	1	1	2	2	3	3	3	4	4			24
<b>TOTAL OPERATING COSTS/ACRE</b>	<b>43</b>	<b>20</b>	<b>87</b>	<b>53</b>	<b>54</b>	<b>49</b>	<b>21</b>	<b>30</b>	<b>38</b>	<b>90</b>	<b>1</b>	<b>1</b>	<b>487</b>
<b>TOTAL OPERATING COSTS/LB</b>	<b>0.03</b>	<b>0.01</b>	<b>0.06</b>	<b>0.04</b>	<b>0.04</b>	<b>0.04</b>	<b>0.02</b>	<b>0.02</b>	<b>0.03</b>	<b>0.07</b>	<b>0.00</b>	<b>0.00</b>	<b>0.35</b>

Table 3. CONTINUED

MONTHLY CASH COSTS PER ACRE TO PRODUCE COTTON  
PALO VERDE VALLEY, RIVERSIDE COUNTY

Beginning JAN 97	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
Ending DEC 97	97	97	97	97	97	97	97	97	97	97	97	97	
OVERHEAD:													
Land Rent												136	136
Office Expense												50	50
Management Fee												50	50
Liability Insurance												35	35
Property Taxes		1					1						3
Property Insurance		1					1						2
Investment Repairs	0	0	0	0	0	0	0	0	0	0	0	0	1
TOTAL CASH OVERHEAD COSTS	0	2	0	0	0	0	2	0	0	0	0	271	276
TOTAL CASH COSTS/ACRE	43	22	87	53	54	50	23	30	38	90	1	272	763
TOTAL CASH COSTS/LB	0.03	0.02	0.06	0.04	0.04	0.04	0.02	0.02	0.03	0.07	0.00	0.20	0.56

Table 4.

WHOLE FARM EQUIPMENT LIST, PRICES, ANNUAL INVESTMENT AND BUSINESS OVERHEAD COSTS  
PALO VERDE VALLEY, RIVERSIDE COUNTY

Yr	Description	Price	ANNUAL EQUIPMENT COSTS					Total
			Yrs Life	Non-Cash Overhead		Cash Overhead		
				Depre- ciation	Interest	Insur- ance	Taxes	
97	120 HP 2WD Tractor #1	40000	6	6000	818	157	220	7195
97	120 HP 2WD Tractor #2	40000	6	6000	818	157	220	7195
97	120 HP 2WD Tractor #3	40000	6	6000	818	157	220	7195
97	120 HP 2WD Tractor #4	40000	6	6000	818	157	220	7195
97	150 HP 2WD Tractor #1	55000	6	8250	1125	216	303	9893
97	150 HP 2WD Tractor #2	55000	6	8250	1125	216	303	9893
97	150 HP 2WD Tractor #3	55000	6	8250	1125	216	303	9893
97	150 HP 2WD Tractor #4	55000	6	8250	1125	216	303	9893
97	225 HP Crawler	155510	6	23327	3182	610	855	27973
97	Cotton Harvester	150000	10	13500	3069	588	825	17982
97	Cotton Planter 440	10500	12	788	215	41	58	1101
97	Cult - 6 Row 40" #1	7830	7	1007	160	31	43	1241
97	Cult - 6 Row 40" #2	7830	7	1007	160	31	43	1241
97	Cult - 6 Row 40" #3	7830	7	1007	160	31	43	1241
97	Disc - 16' Stubble #1	23420	7	3011	479	92	129	3711
97	Disc - 16' Stubble #2	23420	7	3011	479	92	129	3711
97	Disc - 16' Stubble #3	23420	7	3011	479	92	129	3711
97	Disc - 16' Stubble #4	23420	7	3011	479	92	129	3711
97	Disc - 21' Offset #1	16510	7	2123	338	65	91	2616
97	Disc - 21' Offset #2	16510	7	2123	338	65	91	2616
97	Disc - 21' Offset #3	16510	7	2123	338	65	91	2616
97	Disc - 21' Offset #4	16510	7	2123	338	65	91	2616
97	Fertilizer Injector #1	6500	3	1950	133	25	36	2144
97	Fertilizer Injector #2	6500	3	1950	133	25	36	2144
97	Fertilizer Injector #3	6500	3	1950	133	25	36	2144
97	Fertilizer Injector #4	6500	3	1950	133	25	36	2144
97	High Cycle Sprayer #1	4800	3	1440	98	19	26	1583
97	High Cycle Sprayer #2	4800	3	1440	98	19	26	1583
97	High Cycle Sprayer #3	4800	3	1440	98	19	26	1583
97	High Cycle Sprayer #4	4800	3	1440	98	19	26	1583
97	Lister 40" #1	10500	7	1350	215	41	58	1664
97	Lister 40" #2	10500	7	1350	215	41	58	1664
97	Mower - Flail 15' #1	14090	10	1268	288	55	77	1689
97	Mower - Flail 15' #2	14090	10	1268	288	55	77	1689
97	Pickup - 1/2 Ton #1	16483	7	2119	337	65	91	2612
97	Pickup - 1/2 Ton #2	16483	7	2119	337	65	91	2612
97	Sprayer - SP 60 #1	14000	5	2520	286	55	77	2938
97	Sprayer - SP 60 #2	14000	5	2520	286	55	77	2938

Table 4. CONTINUED      WHOLE FARM EQUIPMENT LIST, PRICES, ANNUAL INVESTMENT AND BUSINESS OVERHEAD COSTS

Yr	Description	Price	ANNUAL EQUIPMENT COSTS					Total
			Yrs	Non-Cash Overhead		Cash Overhead		
				Life	Depre- ciation	Interest	Insur- ance	
97	Subsoiler -12' #1	15000	7	1929	307	59	83	2377
97	Subsoiler -12' #2	15000	7	1929	307	59	83	2377
97	Subsoiler -12' #3	15000	7	1929	307	59	83	2377
97	Subsoiler -12' #4	15000	7	1929	307	59	83	2377
<u>TOTAL</u>		1094566		153959	22395	4292	6020	186666
60% of New Cost *		656740		92375	13437	2575	3612	111999

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

Description	Price	ANNUAL INVESTMENT COSTS						Total
		Yrs	Non-Cash Overhead		Cash Overhead			
			Life	Depre- ciation	Interest	Insur- ance	Taxes	
INVESTMENT								
Fuel Tanks & Pumps	38100	15	2286	780	149	210	762	4186
Shop Building	12500	15	750	256	49	69	250	1374
Shop Tools	12500	15	750	256	49	69	250	1374
<u>TOTAL INVESTMENT</u>	63100		3786	1291	247	347	1262	6934

Description	ANNUAL BUSINESS OVERHEAD COSTS			
	Units/ Farm	Unit	Price/ Unit	Total Cost
Land Rent	2250.00	Acre	136.00	306000
Liability Insurance	2250.00	Acre	35.00	78750
Management Fee	2250.00	Acre	50.00	112500
Office Expense	2250.00	Acre	50.00	112500

Table 5.

## WHOLE FARM HOURLY EQUIPMENT COSTS

Yr	Description	Budgeted Hours	COSTS PER HOUR								Total Oper.	Total Costs/Hr.
			Actual Hours Used	Non-Cash Depre- ciation	Overhead Interest	Cash Insur- ance	Overhead Taxes	Operating Repairs	Fuel & Lube			
97	120 HP 2WD Tractor #1	2000	1379.9	2.61	0.36	0.07	0.10	2.40	7.61	10.01	13.14	
97	120 HP 2WD Tractor #2	"	1169.9	3.08	0.42	0.08	0.11	2.40	7.61	10.01	13.70	
97	120 HP 2WD Tractor #3	"	1152.0	3.12	0.43	0.08	0.11	2.40	7.61	10.01	13.76	
97	120 HP 2WD Tractor #4	"	960.0	3.75	0.51	0.10	0.14	2.40	7.61	10.01	14.51	
97	150 HP 2WD Tractor #1	"	1277.4	3.87	0.53	0.10	0.14	3.30	9.51	12.81	17.46	
97	150 HP 2WD Tractor #2	"	1432.6	3.46	0.47	0.09	0.13	3.30	9.51	12.81	16.95	
97	150 HP 2WD Tractor #3	"	1165.1	4.25	0.58	0.11	0.16	3.30	9.51	12.81	17.90	
97	150 HP 2WD Tractor #4	"	927.6	5.34	0.73	0.14	0.20	3.30	9.51	12.81	19.21	
97	225 HP Crawler	"	1663.6	8.41	1.15	0.22	0.31	7.78	14.27	22.05	32.13	
97	Cotton Harvester	200	162.4	49.89	11.34	2.17	3.05	27.26	21.85	49.11	115.56	
97	Cotton Planter 440	100	99.0	4.77	1.30	0.25	0.35	5.27	0.00	5.27	11.94	
97	Cult - 6 Row 40" #1	357	310.1	1.95	0.31	0.06	0.08	2.25	0.00	2.25	4.65	
97	Cult - 6 Row 40" #2	"	310.1	1.95	0.31	0.06	0.08	2.25	0.00	2.25	4.65	
97	Cult - 6 Row 40" #3	"	310.1	1.95	0.31	0.06	0.08	2.25	0.00	2.25	4.65	
97	Disc - 16' Stubble #1	"	281.3	6.42	1.02	0.20	0.27	6.73	0.00	6.73	14.65	
97	Disc - 16' Stubble #2	"	281.3	6.42	1.02	0.20	0.27	6.73	0.00	6.73	14.65	
97	Disc - 16' Stubble #3	"	281.3	6.42	1.02	0.20	0.27	6.73	0.00	6.73	14.65	
97	Disc - 16' Stubble #4	"	281.3	6.42	1.02	0.20	0.27	6.73	0.00	6.73	14.65	
97	Disc - 21' Offset #1	"	281.3	4.53	0.72	0.14	0.19	4.75	0.00	4.75	10.33	
97	Disc - 21' Offset #2	"	281.3	4.53	0.72	0.14	0.19	4.75	0.00	4.75	10.33	
97	Disc - 21' Offset #3	"	281.3	4.53	0.72	0.14	0.19	4.75	0.00	4.75	10.33	
97	Disc - 21' Offset #4	"	281.3	4.53	0.72	0.14	0.19	4.75	0.00	4.75	10.33	
97	Fertilizer Injector #1	400	433.8	2.70	0.18	0.04	0.05	3.92	0.00	3.92	6.88	
97	Fertilizer Injector #2	"	433.8	2.70	0.18	0.04	0.05	3.92	0.00	3.92	6.88	
97	Fertilizer Injector #3	"	433.8	2.70	0.18	0.04	0.05	3.92	0.00	3.92	6.88	
97	Fertilizer Injector #4	"	433.8	2.70	0.18	0.04	0.05	3.92	0.00	3.92	6.88	
97	High Cycle Sprayer #1	"	553.7	1.56	0.11	0.02	0.03	2.41	0.00	2.41	4.12	
97	High Cycle Sprayer #2	"	450.0	1.92	0.13	0.03	0.04	2.41	0.00	2.41	4.52	
97	High Cycle Sprayer #3	"	838.9	1.03	0.07	0.01	0.02	2.41	0.00	2.41	3.54	
97	High Cycle Sprayer #4	"	276.4	3.13	0.21	0.04	0.06	2.41	0.00	2.41	5.84	
97	Lister 40" #1	357	225.0	3.60	0.57	0.11	0.15	3.02	0.00	3.02	7.45	
97	Lister 40" #2	"	225.0	3.60	0.57	0.11	0.15	3.02	0.00	3.02	7.45	
97	Mower - Flail 15' #1	200	223.8	3.40	0.77	0.15	0.21	5.06	0.00	5.06	9.59	
97	Mower - Flail 15' #2	"	223.8	3.40	0.77	0.15	0.21	5.06	0.00	5.06	9.59	
97	Pickup - 1/2 Ton #1	267	175.0	7.27	1.16	0.22	0.31	2.92	3.22	6.14	15.09	
97	Pickup - 1/2 Ton #2	"	175.0	7.27	1.16	0.22	0.31	2.92	3.22	6.14	15.09	
97	Sprayer - SP 60 #1	400	406.2	3.72	0.42	0.08	0.11	3.37	10.93	14.30	18.64	
97	Sprayer - SP 60 #2	"	406.2	3.72	0.42	0.08	0.11	3.37	10.93	14.30	18.64	
97	Subsoiler -12' #1	357	377.6	3.06	0.49	0.09	0.13	4.31	0.00	4.31	8.09	
97	Subsoiler -12' #2	"	377.6	3.06	0.49	0.09	0.13	4.31	0.00	4.31	8.09	

Table 5. CONTINUED

## WHOLE FARM HOURLY EQUIPMENT COSTS

Yr Description	Budgeted Hours	COSTS PER HOUR								
		Actual Hours Used	Non-Cash Depreciation	Overhead Interest	Cash Overhead Insurance	Taxes	Operating Repairs	Fuel & Lube	Total Oper.	Total Costs/Hr.
97 Subsoiler -12' #3	"	377.6	3.06	0.49	0.09	0.13	4.31	0.00	4.31	8.09
97 Subsoiler -12' #4	"	377.6	3.06	0.49	0.09	0.13	4.31	0.00	4.31	8.09

Table 6. RANGING ANALYSIS OF COSTS AND RETURNS TO PRODUCE COTTON  
PALO VERDE VALLEY, RIVERSIDE COUNTY  
COSTS PER ACRE AT VARYING YIELDS TO PRODUCE COTTON

	YIELD (LB/ACRE)						
	1225	1275	1325	1375	1425	1475	1525
-----							
OPERATING COSTS/ACRE:							
Preplant Cost	60	60	60	60	60	60	60
Cultural Cost	319	319	319	319	319	319	319
Harvest Cost	37	39	40	42	44	45	47
Assessment Cost	22	22	22	22	22	22	22
Postharvest Cost	20	20	20	20	20	20	20
Interest on operating capital	24	24	24	24	24	24	24
TOTAL OPERATING COSTS/ACRE	482	484	485	487	488	490	491
TOTAL OPERATING COSTS/LB	0.39	0.38	0.37	0.35	0.34	0.33	0.32
CASH OVERHEAD COSTS/ACRE	276	276	276	276	276	276	276
TOTAL CASH COSTS/ACRE	759	760	762	763	765	766	768
TOTAL CASH COSTS/LB	0.62	0.60	0.57	0.56	0.54	0.52	0.50
NON-CASH OVERHEAD COSTS/ACRE	71	71	71	71	71	71	71
TOTAL COSTS/ACRE	830	831	833	834	836	837	839
TOTAL COSTS/LB	0.68	0.65	0.63	0.61	0.59	0.57	0.55

Table 6. CONTINUED

NET RETURNS PER ACRE ABOVE OPERATING COSTS FOR COTTON							
PRICE (DOLLARS PER LB)	YIELD (LB/ACRE)						
	1225	1275	1325	1375	1425	1475	1525
0.36	-30	-13	3	20	37	54	71
0.46	95	117	139	161	183	205	227
0.56	221	248	275	302	329	356	384
0.66	346	379	411	443	475	508	540
0.76	472	509	547	584	621	659	696
0.86	597	640	682	725	767	810	852
0.96	723	770	818	866	913	961	1009

NET RETURNS PER ACRE ABOVE CASH COSTS FOR COTTON							
PRICE (DOLLARS PER LB)	YIELD (LB/ACRE)						
	1225	1275	1325	1375	1425	1475	1525
0.36	-307	-290	-273	-256	-239	-222	-205
0.46	-181	-159	-137	-115	-93	-71	-49
0.56	-56	-29	-1	26	53	80	107
0.66	70	102	134	167	199	231	263
0.76	195	233	270	308	345	382	420
0.86	321	363	406	448	491	534	576
0.96	446	494	542	589	637	685	732

NET RETURNS PER ACRE ABOVE TOTAL COSTS FOR COTTON							
PRICE (DOLLARS PER LB)	YIELD (LB/ACRE)						
	1225	1275	1325	1375	1425	1475	1525
0.36	-378	-361	-344	-327	-310	-293	-276
0.46	-252	-230	-208	-186	-164	-142	-120
0.56	-127	-100	-72	-45	-18	9	36
0.66	-1	31	63	96	128	160	192
0.76	124	162	199	236	274	311	349
0.86	250	292	335	377	420	462	505
0.96	375	423	471	518	566	614	661