
1995/1996

University of California Cooperative Extension

Production Practices
and Sample Costs To Produce



~ *Okra* _

Furrow Irrigated

**Coachella Valley
Riverside County**

By

Etaferahu Takele, Area Farm Advisor, Farm Management Economics, Southern Region

Jose Aguiar, Farm Advisor, Vegetable Crops and Small Farms, Riverside County

and

Paul Zellman, Staff Research Associate, Farm Management Economics, Southern Region

University of California Cooperative Extension

Sample Costs To Produce Okra Riverside County - 1995/1996

INTRODUCTION

Detailed costs to produce okra in Coachella Valley, Riverside County, California are presented in this study. The hypothetical farm used in this report consists of approximately 80 acres, of which 10 acres are in okra production.

This study consists of General Assumptions for producing okra along with six tables of cost analysis. The practices described in this study are considered typical for okra production in the Coachella Valley of Riverside County. They do not reflect the exact values or practices of any single grower or shipper, but rather an amalgamation of costs and practices in the region. Sample costs given for labor, materials, equipment and contract services are based on 1995/1996 prices. Some costs and practices are not applicable to your situation. *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.* This study is intended as a guide, it can be used in making production decisions, determining potential returns, preparing budgets and evaluating production loans.

Costs are presented in six tables:

Table 1.	Costs Per Acre To Produce Okra
Table 2.	Costs And Returns Per Acre To Produce Okra
Table 3.	Monthly Cash Costs Per Acre To Produce Okra
Table 4.	Annual Equipment, Investment And Business Overhead
Table 5.	Hourly Equipment Costs
Table 6.	Ranging Analysis

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

For an explanation of calculations used in this study refer to the attached General Assumptions, or call either the Area Farm Management Economics Advisor, Riverside County, Cooperative Extension, (909) 683-6491 ext. 243, or the Vegetable Crops Farm Advisor in the Coachella Valley of Riverside, County (619) 863-8293.

The University of California Cooperative Extension in compliance with the Civil Rights Act of 1964, Title IX of the Education Amendments of 1972, and the Rehabilitation Act of 1973 does not discriminate on the basis of race, creed, religion, color, national origins, or mental or physical handicaps in any of its programs or activities, or with respect to any of its employment practices or procedures. The University of California does not discriminate on the basis of age, ancestry, sexual orientation, marital status, citizenship, medical condition (as defined in section 12926 of the California Government Code) or because the individuals are disabled or Vietnam era veterans. Inquiries regarding this policy may be directed to the Personnel Studies and Affirmative Action Manager, Agriculture and Natural Resources, 2120 University Avenue, University of California, Berkeley, California 94720, (415) 644-4270.

University of California and the United States Department of Agriculture cooperating.

ASSUMPTIONS USED IN THIS STUDY

The following is a description of the assumptions used in this study to develop costs of production of spring planted and harvested okra in the Coachella Valley of Riverside County in 1995/1996.

1. LAND RENT

This report is based on an 80 acre row crop farm: 10 acres produce okra; 50 acres are planted to peppers, squash, pickling cucumbers and eggplant; and the remaining 20 acres are left fallow typically to facilitate weed control operations. Spring and fall plantings on these 60 producing acres result in 120 farmed acres per year. Other rotational crops that might also be planted on this same ground include green beans, broccoli, cauliflower, lettuce, onions, sweet corn and mixed melons.

Rental contracts and rates for land suitable for okra production can range widely. Land in this study is leased on a cash rent basis at \$200 per acre per year for the entire 80 acres. Since 20 acres are left fallow, rent per planted acre is \$267. As the remaining 60 of the 80 acres is double cropped, the amount of the annual rent per planted acre allocated to the okra operation is \$133.

2. CULTURAL PRACTICES AND PRODUCTION INPUTS

Land Preparation: Primary tillage and planting groundwork operations include chopping prior crop residues, disking, subsoiling, floating, and listing beds. These operations are performed from December through January beginning in the year preceding planting. All operations requiring equipment are performed with either a 60 or 90 hp wheel tractor. Operations that are done on only a percentage of the acreage are noted throughout this section and in the tables; all other operations are done on 100% of the acreage.

Beginning in December any standing plant residue from previous crops (such as corn, broccoli or cauliflower) should be chopped to enhance decomposition. Chopped residues should be disced while there is still some soil moisture in order to avoid forming large, hard clods on heavier soils. Breakdown rate of crop residues depends upon temperature, moisture, soil aeration, ample nitrogen and particle size of crop residues. Stubble is disced across the previous crop rows to assure good aeration of the soil, adequate burial of organic matter, and to aid in the control of pests and diseases.

Following chopping and disking, the soil is plowed. The ground is land-planed in two passes with a triplane so high and low spots are removed to allow for efficient irrigation and better drainage. Disking and rolling is performed twice to help break up large clods of soil, smooth, and firm the ground in advance of land leveling. Periodic land preparation practices may include laser leveling and deep ripping. Laser leveling may be performed every two to four years by a contract leveling company. Deep ripping the soil profile 2 to 3 feet breaks up any underlying sand layers for improved root and water penetration.

Chicken manure (three to four tons per acre) is custom applied a week or more prior to listing. The manure is broadcasted and incorporated by disking and floating.

Most growers form beds with a two-row lister on 40 inch centers. The final bed preparation and seeding operation entails shanking-in fertilizer, bed shaping and seeding in one pass. These operations are completed by January 15.

Stand Establishment: Planting begins after the last killing frost (approximately February 1). The best planting time in the Coachella Valley is from February through March. Most growers in the Coachella Valley plant okra by February 15. Optimum soil temperatures for seed germination are 75_ to 90_F (24_ to 32_C). Germination is extremely poor below 60_F (16_C). Studies show that it will take 17 days for the okra seeds to emerge at 68_F (20_C), 13 days at 77_F (25_C), and 7 days at 86_F (30_C).

In this study, the seeding rate is 15 pounds per acre (7 seeds per foot of row), planted about 1_ inches deep. (In some states, 4-6 week old okra transplants are used to establish a stand. These plants have 3-4 true leaves at transplanting time.) For early plantings, plant in east to west rows with a north to south sloped beds. When the plants reach a height of 3 inches, they are thinned 6 inches apart in the row during March.

Open-pollinated varieties are commonly used in this region. A few growers raise other hybrid varieties on one to two acres. Each variety has advantages and disadvantages and needs to be carefully considered to meet specific grower requirements. Most of the cultivars used for commercial trade are green color, ribbed and spineless.

- Clemson Spineless - the standard open pollinated variety which has been in use for over 40 years. It is still in use because of lower seed costs. Pods are slightly grooved, and dark green in color. Plant height is normally about 4 feet.
- Clemson Spineless 80 - an open pollinated cultivar selection from Clemson Spineless selected for shorter plants, less branching, and greater uniformity
- Annie Oakley F1- a very prolific hybrid that produces bright green pods and reported to produce nearly double the yield of standard varieties. Seed is considerably more expensive than open pollinated varieties and therefore, growers are reluctant to grow it. Precision planting can reduce seed requirements and costs.
- Other varieties which have been grown or are under trial include: Green Best F1, Penta-Green OP, Annie Oakley II, Emerald, Picacho, Velvet, and Lee.

Weed Management: Many growers and consultants advise against planting without using a preplant herbicide. Principal targeted weeds include nutsedge and bermudagrass. It is best to avoid fields infested with nutsedge for optimum yields. The selection of a specific herbicide depends on the kinds of weeds that predominate. Consult your pest control advisor for advice as legally recommended herbicides change from year to year.

In this study, both chemical and cultural practices are used for weed control. Chemical control begins in January with a pre-emergent herbicide, Treflan_ , applied with a spray bar followed by a disc which both incorporates and seals the material into the soil. Mechanical cultivation is accomplished with rolling cultivators twice during the season in March and April. The early cultivation should be shallow so as not to injure the young okra roots. Hand hoeing is performed once in May.

Fertilization: Fertility management often begins with a custom application of 3 to 4 tons of chicken manure per acre during land preparation. The manure is broadcast, then disced and floated for incorporation. A preplant application of chemical fertilizers (e.g. 1,000 pounds per acre of 11-52-0) can be substituted for the nitrogen component of the chicken manure. The fertilizer should be broadcast and listed into the beds. Another option is to inject 15 gallons per acre of 5-35-0 four inches below and one inch to the side of the seed rows.

An additional 40 to 60 pounds of nitrogen (N) per acre is sidedressed about 1_ months after planting. Various formulations of nitrogen can be used. In this study, CAN 17 is sidedressed and UN 32 is injected into the irrigation water. Sidedressing occurs in March and water-run N is applied in April. Other nitrogen sources may be substituted: dry ammonium nitrate or urea; liquid AN 20 or UN 32; or aqua ammonia. The total seasonal nitrogen application is about 190 pounds of N per acre and about 130 pounds of elemental phosphorus per acre.

Irrigation: In this study, the crop is planted in moist soil (called mulch planting). Some growers choose to plant in dry soil and then furrow irrigate. The okra is furrow irrigated throughout the growing season. If the soil has good moisture at planting, the young seedlings will grow 3 to 5 inches before another irrigation is needed. Heavy early irrigation tend to cool the soil and slow plant growth. The plants should *not* be water stressed for maximum yields. During the harvest period, every other row is irrigated leaving a dry furrow for pickers to walk.

In this study, water is supplied by the Coachella Valley Water District (CVWD). Many growers also have private wells which can affect price and timing of irrigation. Price of water from CVWD is \$14 per acre foot (plus \$10 gate charge). In this study, 30 acre-inches of water is applied, while a range of 26 to 30 acre-inches of water is common depending on grower preferences and climate. The cost of irrigation shown in **Tables 1, 2, and 3** are for the cost of the water and labor to apply it.

Pest Management: In this study, the only pest management practice was the release of lady bugs for the control of aphids. In some years, the following insects can damage okra during stand establishment: cutworms, crickets and earwigs. During the growing season, silverleaf whitefly and aphids could be present in damaging numbers. Before harvest cotton bollworm, corn earworm, tobacco budworm, beet armyworm, lygus and stinkbugs can be a problem.

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.

Okra is very susceptible to root knot nematodes, which reduce crop yields and cause secondary infection by fungi in the roots. Avoid soils contaminated with root knot nematode, or fields that have continually been cropped to okra. No treatment for rootknot nematodes is included in this study.

Disease Management: Okra diseases include “damping-off,” a consortia of soil borne fungi including *Pythium*, *Rhizoctonia* and others. The incidence of “damping-off” diseases is reduced when all prior crop residues is fully decomposed prior to planting.

Verticillium wilt is another fungal disease which can be a problem in okra. The water transporting cells in the plant become clogged with fungal hypae and the plants droop and wilt. Crop rotation is the best control. Okra, eggplant and tomatoes should *not* be planted in the same field more than once every 4 years.

The pesticides and rates mentioned in this cost study are a few of those that are listed in *Pest of the Garden and Small Farm: A Growers Guide to Using Less Pesticide* and *UC Pest Management Guidelines*. 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 your Riverside County farm advisor for additional production information.

3. HARVESTING AND POSTHARVEST HANDLING

Harvest: The edible part of the okra plant is the immature pod. It is harvested when still tender at a size of 3 to 5 inches in length. The first pods may be ready to harvest two months after planting and will continue to bear for several months, especially when over-mature pods are removed on a regular basis. The pods reach marketable size approximately 4 to 6 days after flowering. Sizes of 3 to 5 inches are considered optimum for consumption. If the pods grow longer, they will become more fibrous and lower in quality and value. Okra that are 3 inches or smaller are marketed as Extra Fancy. Okra that are longer than 3 inches are sold as Fancy.

Early in the season, okra is harvested every 2 to 3 days, more often under very warm conditions. In this study, hand harvesting is used where pods are snapped from the plant without the use of knives or shears. Workers wear gloves and long-sleeve shirts to avoid the irritation that may be caused by contact with the plants. Later in the season, harvesting is carried out daily, and may be continued for several months under ideal growing conditions.

Postharvest Handling: The pods must be handled with care to avoid bruising. Bruises will turn black a few hours after rough handling. The use of soft cotton gloves will help prevent pod damage. Okra should not be stored in large bins or hampers since the pods will bleach due to lack of proper ventilation. Okra may be spray washed or simply placed in a large water tank for cleaning. Wash water is disinfected using a chlorine concentration of 75 to 100 PPM. Excess water should be removed after packing.

Okra should be stored at 45_F (7_C) and a relative humidity of 90 to 95%. At higher temperatures, the pods will yellow, toughen and start to decay. As little as 3% moisture loss will cause okra to appear wilted. Okra should be marketed immediately after harvesting. Storage shelf-life for okra is 7 to 10 days.

Never use top ice on okra boxes or baskets, icing causes water spots on the pods after 2 to 3 days. At temperatures below 45_F (7_C), okra suffers chilling injury which appears as surface pitting, discoloration of the pods, and excessive decay.

In general, okra has the same storage requirements as green beans, cucumber, eggplant, peppers and squash. These products may be stored together without damage.

Harvesting and packing are the major costs of producing fresh market okra. Picking is typically performed on a custom piece rate basis. Rates begin at a relatively high price early in the season when there is less harvestable fruit. Rates decline over the season as the plants come into full production. In this study, we use a seasonal average piece rate for picking of \$3.75 per 20 pound box. Okra is packed at nearby field sheds. Packing, like harvesting, is also performed on a custom piece rate basis, which for this study is \$1.40 per 20 pound box. An objective of some growers is to maintain an equivalent hourly rate of \$5.00 to \$7.00 per hour. Costs for harvest operations are shown in **Table 1** and **Table 3**.

4. YIELDS & RETURNS:

Yields: In any given year yields vary considerably. Average crop yields in Coachella Valley from 1989 to 1995 are shown to range from 150 to 1,200 boxes per acre (Table A). In this study, a yield of 800 boxes per acre is used. Each box weighs 20 pounds.

Returns: Prices per 20 pound box vary during the season. Early season prices (_April 1), can begin at over \$30.00 per box and then decline to less than \$6.00 per box late in the season (_July 15). Growers market their crop through the local or Los Angeles brokers where they pay a percentage fee based on the FOB price per box. Brokers fees are usually 10% of the wholesale prices in the local market and about 20% of the wholesale prices in the Los Angeles Market. In this study marketing of Okra is through the Los Angeles wholesale market. We used a seasonal price of \$10/box 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 A. Average yield of fresh market okra, Riverside County, 1989 - 1995¹

Year	Acres Planted	Boxes Per Acre ²
1989	165	1,200
1990	101	150
1991	102	307
1992	100	739
1993	150	1,000
1994	120	1,150
1995	226	1,000

1/ From Riverside County Crop Reports, 1989 - 1995

2/ Box = 20 pounds

5. RISK

The risks associated with fresh market okra production should be noted. While this study makes every effort to model a production system based on typical practices, it cannot fully represent financial, agronomic and market risks which affect the profitability and economic viability of fresh market okra production. Examples of risk include insect damage, a decrease in price, and increase in interest rates. Because of the risk involved, access to production information as well as to financial and produce markets is crucial.

6. LABOR

The basic hourly wage is \$5.00 per hour for both machine operators and non-machine workers. Growers also pay 20 to 34 percent for Workers Compensation, Social Security, Medicare insurance and other possible benefits. In this study we used 34% which brings the labor rate to \$6.70 per hour. Machinery labor hours are 20% higher than the operation time to account for the extra labor involved in equipment set up, moving, maintenance, and repair. Irrigation labor is calculated using 23 weeks of growing period (growing period ranges from 15 to 30 weeks); twice a week irrigation frequency and 15 minutes per irrigation needed to check the system.

7. MANAGEMENT

This study assumes that the farm is operated and managed by the same person. Users of this cost study should include their own management charges.

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 \$25 per cropped acre.

Office Expenses: Office and business expenses are estimated at \$30.00 per acre. These expenses include office supplies, telephones, bookkeeping, accounting, legal fees, road maintenance, etc. Cash overhead costs are found in **Tables 1, 2, 3 and 4.**

9. NON-CASH OVERHEAD

Non-cash overhead is comprised of depreciation and interest charged on equipment and other investments. Farm equipment on a typical farm in the Coachella Valley is often purchased used. This study shows the current purchase price for new equipment adjusted to 60% of new value to indicate a mix of new and used equipment. Annual equipment and investments 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 calculated using a straight line method. 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 on a per acre basis.

The interest rate used to calculate opportunity cost is estimated as a ten year average of the 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 agricultural sector.

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, the 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 \$0.86 (off-road, no tax) and gasoline is \$1.23 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.

ACKNOWLEDGMENT

We express our appreciation to those growers and other cooperators who provided data for the development of this cost study. Cultural practices references have also been made from a report that is being developed by Keith S. Mayberry and Jose Aguiar, Farm Advisors, Imperial and Riverside counties, respectively. Appreciation is also expressed to Delos Walton, Staff Research Associate, for assisting in the development of the final report.

REFERENCES:

1. American Society of Agricultural Engineers. 1992. *American Society of Agricultural Engineers Standards Yearbook*. St. Joseph, MI.
2. Boelje, Michael D., and Vernon R. Eidman. 1984. *Farm Management*. John Wiley and Sons. New York, NY
3. Statewide IPM Project. 1990. *Pests of the Garden and Small Farm: A Grower's Guide to Using Less Pesticide*. Pub. 3332. UC DANR. Oakland, CA.
4. Myers, C. 1991. *Specialty and Minor Crops Handbook*. 1991. Pub. 3346. The Small Farm Center, UC DANR. Oakland, CA
5. Lorenz, O.A. and D. N. Maynard. 1988. *Knott's Handbook for Vegetable Growers*. New York, NY. Wiley
6. Schweers, V.H. and Sims, W.L. 1976. *Okra Production*. Leaflet 2679, 5 pp. UC DANR Oakland, CA
7. USDA-ERS. 1991. *Economic Indicators of the Farm Sector: National Financial Summary Agriculture and Rural Economics Division*. ERS. USDA, Washington, DC.

Table 1.

U.C. COOPERATIVE EXTENSION
COSTS PER ACRE TO PRODUCE OKRA
Coachella Valley - 1995/96

Labor Rate: \$ 6.70/hr. machine labor Interest Rate: 11.61%
\$ 6.70/hr. non-machine labor Yield per Acre: 800.00 Box

Operation	Operation Time (Hrs/A)	Cash and Labor Costs per Acre					Total Cost	Your Cost
		Labor Cost	Fuel,Lube & Repairs	Material Cost	Custom/ Rent			
Preplant:								
Chop Prior Crop Residue	0.30	2	3	0	0	5		
Disc 2X	1.40	11	12	0	0	24		
Plow	1.20	10	10	0	0	20		
Leveling - Land plane (2x)	0.90	7	8	0	0	15		
Apply & Incorporate Herbicide	1.40	11	15	5	0	31		
Custom Manure Application	0.00	0	0	0	75	75		
Disc & Float	1.00	8	9	0	0	17		
List	0.60	5	5	0	0	9		
Irrigation - Furrow	1.92	28	0	12	0	40		
Shape Beds	0.50	4	4	0	0	8		
Seed Okra	1.60	24	14	30	0	67		
	-----	-----	-----	-----	-----	-----		
TOTAL PREPLANT COSTS	10.82	111	80	47	75	313		
Cultural:								
Irrigation - Furrow	7.68	67	0	40	0	107		
Thin Stand	0.00	0	0	0	30	30		
Cultivate Beds	1.00	8	6	0	0	14		
Side dress CAN-17	0.50	4	3	25	0	32		
Irrigate & UN 32	1.92	13	0	27	0	40		
Hoe Weeds	0.00	0	0	0	30	30		
Apply Ladybird Beetles	0.10	1	0	20	0	21		
	-----	-----	-----	-----	-----	-----		
TOTAL CULTURAL COSTS	11.20	92	9	112	60	274		
Harvest:								
Pick & Pack Okra	0.50	4	0	0	4214	4218		
Ship to LA Market	0.00	0	0	0	800	800		
LA Broker Commission	0.00	0	0	0	1600	1600		
	-----	-----	-----	-----	-----	-----		
TOTAL HARVEST COSTS	0.50	4	0	0	6614	6618		
Postharvest:								
Chop Okra Stalks	1.00	8	8	0	0	16		
	-----	-----	-----	-----	-----	-----		
TOTAL POSTHARVEST COSTS	1.00	8	8	0	0	16		
Interest on operating capital @ 11.61%							36	
TOTAL OPERATING COSTS/ACRE		215	98	159	6749	7256		
TOTAL OPERATING COSTS/BOX							9.07	

U.C. COOPERATIVE EXTENSION

Table 1. Continued

	Operation	Cash and Labor Costs per Acre					Total Cost	Your Cost
	Time (Hrs/A)	Labor Cost	Fuel,Lube & Repairs	Material Cost	Custom/ Rent			
CASH OVERHEAD:								
Land Rent						133		
Office Expense						30		
Liability Insurance						25		
Sanitation						0		
Property Taxes						4		
Property Insurance						3		
Investment Repairs						4		
TOTAL CASH OVERHEAD COSTS						200		
TOTAL CASH COSTS/ACRE						7456		
TOTAL CASH COSTS/BOX						9.32		
NON-CASH OVERHEAD:								
	Per producing Acre	Annual Cost						
Investment		Depreciation	Interest @	3.72%				
Shop Building	125	6	3		8			
Shop Tools	42	2	1		3			
Fuel Tanks & Pumps	50	3	1		4			
Equipment	528	38	11		48			
TOTAL NON-CASH OVERHEAD COSTS						63		
TOTAL COSTS/ACRE						7519		
TOTAL COSTS/BOX						9.40		

U.C. COOPERATIVE EXTENSION

Table 2. Continued

CASH OVERHEAD COSTS:	
Land Rent	133
Office Expense	30
Liability Insurance	25
Sanitation	0
Property Taxes	4
Property Insurance	3
Investment Repairs	4

TOTAL CASH OVERHEAD COSTS/ACRE	200

TOTAL CASH COSTS/ACRE	7456
TOTAL CASH COSTS/BOX	9.32

NON-CASH OVERHEAD COSTS (DEPRECIATION & INTEREST):	
Shop Building	8
Shop Tools	3
Fuel Tanks & Pumps	4
Equipment	48

TOTAL NON-CASH OVERHEAD COSTS/ACRE	63

TOTAL COSTS/ACRE	7519
TOTAL COSTS/BOX	9.40

NET RETURNS ABOVE TOTAL COSTS	481
=====	

Table 3.

U.C. COOPERATIVE EXTENSION
MONTHLY CASH COSTS PER ACRE TO PRODUCE OKRA
Coachella Valley - 1995/96

Beginning DEC 94	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	TOTAL
Ending NOV 95	94	95	95	95	95	95	95	95	95	95	95	95	
Preplant:													
Chop Prior Crop Residue	5												5
Disc 2X	24												24
Plow	20												20
Leveling - Land plane (2x)	15												15
Apply & Incorporate Herbicide		31											31
Custom Manure Application		75											75
Disc & Float		17											17
List		9											9
Irrigation - Furrow		40											40
Shape Beds				8									8
Seed Okra				67									67
TOTAL PREPLANT COSTS	64	173	76										313
Cultural:													
Irrigation - Furrow				40	25	21	21						107
Thin Stand				30									30
Cultivate Beds				7	7								14
Side dress CAN-17				32									32
Irrigate & UN 32					40								40
Hoe Weeds						30							30
Apply Ladybird Beetles						21							21
TOTAL CULTURAL COSTS				109	72	72	21						274
Harvest:													
Pick & Pack Okra					1374	1370	1474						4218
Ship to LA Market					266	266	268						800
LA Broker Commission					532	532	536						1600
TOTAL HARVEST COSTS					2172	2168	2278						6618
Postharvest:													
Chop Okra Stalks								16					16
TOTAL POSTHARVEST COSTS								16					16
Interest on oper. capital	1	2	3	4	26								36
TOTAL OPERATING COSTS/ACRE	65	175	79	113	2270	2239	2299	16					7256
TOTAL OPERATING COSTS/BOX	0.08	0.22	0.10	0.14	2.84	2.80	2.87	0.02					9.07

Table 3. Continued

U.C. COOPERATIVE EXTENSION
 MONTHLY CASH COSTS PER ACRE TO PRODUCE OKRA
 Coachella Valley - 1995/96

Beginning DEC 94 Ending NOV 95	DEC 94	JAN 95	FEB 95	MAR 95	APR 95	MAY 95	JUN 95	JUL 95	AUG 95	SEP 95	OCT 95	NOV 95	TOTAL
OVERHEAD:													
Land Rent	17	17	17	17	17	17	17	17					133
Office Expense	4	4	4	4	4	4	4	4					30
Liability Insurance	3	3	3	3	3	3	3	3					25
Sanitation	0	0	0	0	0	0	0	0					0
Property Taxes		2						2					4
Property Insurance		1						1					3
Investment Repairs	0	0	0	0	0	0	0	0	0	0	0	0	4
TOTAL CASH OVERHEAD COSTS	24	27	24	24	24	24	24	27	0	0	0	0	200
TOTAL CASH COSTS/ACRE	89	203	102	137	2294	2263	2323	44	0	0	0	0	7456
TOTAL CASH COSTS/BOX	0.11	0.25	0.13	0.17	2.87	2.83	2.90	0.05	0.00	0.00	0.00	0.00	9.32

Table 4.

U.C. COOPERATIVE EXTENSION
 WHOLE FARM ANNUAL EQUIPMENT, INVESTMENT, AND BUSINESS OVERHEAD COSTS TO PRODUCE OKRA
 Coachella Valley - 1995/96

ANNUAL EQUIPMENT COSTS								
Yr	Description	Price	- Non-Cash Over. - - Cash Overhead -				Total	
			Yrs Life	Depre- ciation	Interest	Insur- ance		Taxes
95	60 HP 2WD Tractor	27765	12	2082	568	109	153	2912
95	90 HP 2WD Tractor	35000	12	2625	716	137	192	3671
95	Bed Shaper - 3 Row	3600	12	270	74	14	20	378
95	Cult - 2 Row 40"	4250	15	255	87	17	23	382
95	Disc - 8' Offset	6100	15	366	125	24	34	548
95	Lister - 3 Row 40"	1600	15	96	33	6	9	144
95	Mower - Flail 6'	3420	10	308	70	13	19	410
95	Planter - 2 Row 40	3150	10	283	64	12	17	378
95	Plow - 3 bot	5600	15	336	115	22	31	503
95	Shank injector	1800	12	135	37	7	10	189
95	Sprayer - 200 Gal	3000	10	222	70	13	19	325
95	Toolbar - 4 Row 40	1240	15	74	25	5	7	111
95	Triplane - 12	13600	15	816	278	53	75	1222
TOTAL		110125		7869	2262	434	608	11173
60% of New Cost *		66075		4721	1357	260	365	6704

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

ANNUAL INVESTMENT COSTS								
Description	Price	- Non-Cash Over. - ----- Cash Overhead -----				Total		
		Yrs Life	Depre- ciation	Interest	Insur- ance		Taxes	Repairs
INVESTMENT								
Fuel Tanks & Pumps	6000	15	360	123	24	33	120	659
Shop Building	15000	20	675	307	59	83	300	1423
Shop Tools	5000	20	225	102	20	28	100	474
TOTAL INVESTMENT	26000		1260	532	102	143	520	2557

ANNUAL BUSINESS OVERHEAD COSTS				
Description	Units/ Farm	Unit	Price/ Unit	Total Cost
Land Rent	120.00	Acre	133.00	15960
Liability Insurance	120.00	Acre	25.00	3000
Office Expense	120.00	Acre	30.00	3600
Sanitation	1.00	Mon	40.00	40

Table 5.

U.C. COOPERATIVE EXTENSION
 HOURLY EQUIPMENT COSTS TO PRODUCE OKRA
 Coachella Valley - 1995/96

Yr Description	COSTS PER HOUR								
	Actual Hours Used	-Non-Cash Depre- ciation	Over.- Interest	- Cash Insur- ance	Overhead - Taxes	Repairs	Operating Fuel & Lube	Total Oper.	Total Costs/Hr.
95 60 HP 2WD Tractor	192.5	6.49	1.77	0.34	0.48	1.67	2.91	4.58	13.65
95 90 HP 2WD Tractor	1306.9	1.21	0.33	0.06	0.09	2.10	4.37	6.47	8.16
95 Bed Shaper - 3 Row	60.0	2.70	0.74	0.14	0.20	0.97	0.00	0.97	4.74
95 Cult - 2 Row 40"	120.0	1.28	0.43	0.08	0.12	1.22	0.00	1.22	3.13
95 Disc - 8' Offset	456.0	0.48	0.16	0.03	0.04	1.75	0.00	1.75	2.47
95 Lister - 3 Row 40"	72.0	0.80	0.27	0.05	0.07	0.46	0.00	0.46	1.66
95 Mower - Flail 6'	156.0	1.18	0.27	0.05	0.07	1.23	0.00	1.23	2.81
95 Planter - 2 Row 40	192.0	0.89	0.20	0.04	0.05	1.58	0.00	1.58	2.76
95 Plow - 3 bot	144.0	1.40	0.48	0.09	0.13	1.61	0.00	1.61	3.71
95 Shank injector	60.0	1.35	0.37	0.07	0.10	1.09	0.00	1.09	2.97
95 Sprayer - 200 Gal	168.0	0.79	0.25	0.05	0.07	1.51	0.00	1.51	2.67
95 Toolbar - 4 Row 40	168.0	0.27	0.09	0.02	0.02	0.35	0.00	0.35	0.75
95 Triplane - 12	108.0	4.53	1.55	0.30	0.42	1.97	0.00	1.97	8.77

Table 6.

U.C. COOPERATIVE EXTENSION
 RANGING ANALYSIS TO PRODUCE OKRA
 Coachella Valley - 1995/96

COSTS PER ACRE AT VARYING YIELDS TO PRODUCE OKRA

	YIELD (BOX/ACRE)						
	500	600	700	800	900	1000	1100
OPERATING COSTS/ACRE:							
Preplant Cost	313	313	313	313	313	313	313
Cultural Cost	274	274	274	274	274	274	274
Harvest Cost	4138	4964	5791	6618	7445	8271	9098
Postharvest Cost	16	16	16	16	16	16	16
Interest on operating capital	28	31	33	36	38	41	44
TOTAL OPERATING COSTS/ACRE	4768	5598	6427	7256	8086	8915	9744
TOTAL OPERATING COSTS/BOX	9.54	9.33	9.18	9.07	8.98	8.92	8.86
CASH OVERHEAD COSTS/ACRE	200	200	200	200	200	200	200
TOTAL CASH COSTS/ACRE	4968	5797	6627	7456	8285	9115	9944
TOTAL CASH COSTS/BOX	9.94	9.66	9.47	9.32	9.21	9.11	9.04
NON-CASH OVERHEAD COSTS/ACRE	63	63	63	63	63	63	63
TOTAL COSTS/ACRE	5031	5861	6690	7519	8349	9178	10008
TOTAL COSTS/BOX	10.06	9.77	9.56	9.40	9.28	9.18	9.10

NET RETURNS PER ACRE ABOVE OPERATING COSTS FOR OKRA

PRICE (DOLLARS PER BOX)	YIELD (BOX/ACRE)						
	500	600	700	800	900	1000	1100
7.00	-1268	-1398	-1527	-1656	-1786	-1915	-2044
8.00	-768	-798	-827	-856	-886	-915	-944
9.00	-268	-198	-127	-56	14	85	156
10.00	232	402	573	744	914	1085	1256
11.00	732	1002	1273	1544	1814	2085	2356
12.00	1232	1602	1973	2344	2714	3085	3456
13.00	1732	2202	2673	3144	3614	4085	4556

U.C. COOPERATIVE EXTENSION

Table 6. Continued

NET RETURNS PER ACRE ABOVE CASH COSTS FOR OKRA

PRICE (DOLLARS PER BOX)	YIELD (BOX/ACRE)						
	500	600	700	800	900	1000	1100
7.00	-1468	-1597	-1727	-1856	-1985	-2115	-2244
8.00	-968	-997	-1027	-1056	-1085	-1115	-1144
9.00	-468	-397	-327	-256	-185	-115	-44
10.00	32	203	373	544	715	885	1056
11.00	532	803	1073	1344	1615	1885	2156
12.00	1032	1403	1773	2144	2515	2885	3256
13.00	1532	2003	2473	2944	3415	3885	4356

NET RETURNS PER ACRE ABOVE TOTAL COSTS FOR OKRA

PRICE (DOLLARS PER BOX)	YIELD (BOX/ACRE)						
	500	600	700	800	900	1000	1100
7.00	-1531	-1661	-1790	-1919	-2049	-2178	-2308
8.00	-1031	-1061	-1090	-1119	-1149	-1178	-1208
9.00	-531	-461	-390	-319	-249	-178	-108
10.00	-31	139	310	481	651	822	992
11.00	469	739	1010	1281	1551	1822	2092
12.00	969	1339	1710	2081	2451	2822	3192
13.00	1469	1939	2410	2881	3351	3822	4292