1974

AV-SC-74-3

AVOCADO ECONOMICS: AN EVALUATION OF COSTS AND RETURNS

B. W. Lee
Ventura County Farm Advisor

This report is based on the supposition that you are interested not only in growing avocados, but also in making money while doing it. This report will point out some facts and figures, do a little explaining, and generally inform you it's not going to be easy. As of 1972, the latest year figures are vailable, there were 25,640 acres of avocados in California, 6,000 of which were nonbearing, respresenting a 30 percent increase in production acreage in the next 4 years. In addition, about 1500 acres are being planted each year. The basis of this report is not how much money you'll make growing avocados but how much you'll have to make to stay in business.

The first important consideration is that a five-uear-old avocado orchard has an investment value of $7,822 per acre. This represents money spent plus money that could have been earned if initial money was invested elsewhere at 7 percent interest.

The second important consideration is the annual cost of production for a mature orchard which is $1,293 per acre. This includes a 7 percent return on investment plus a charge for grower's labor. The $1,293 represents what total costs would be of all work done by someone else or the grower received $3.00 per hour including fringe benefits for his labor. A grower's labor must be considered because he could work for someone else and receive at least this wage for his time. When figuring costs, a grower should not fail to consider the cost of his own time. If you can show returns equalling $1,293 per acre, you will be covering all cash costs plus allowing for depreciation of equipment plus a 7 percent return on all the money you have invested. What is left is net management income or profit. If the money to develop and operate the orchard was borrowed, this 7 percent represents the interest you would be paying on the loan. If the interest charge is higher than 7 percent, you will have to adjust or strive to match your returns accordingly. Before we see how the returns match up, it is necessary to explain how the figures of $7,822 and $1,293 were derived.

INVESTMENT

Refer to the attached AVOCADO ORCHARD DEVELOPMENT COSTS FOR VENTURA COUNTY.

TOTAL LABOR AND FIELD POWER (1)..... $278

This includes the following: land preparation, orchard layout, planting, irrigation, fertilization, weed control, pest control, tree care (mulching, protectors, staking, tieing, pruning), and miscellaneous items such as erosion control and repairs.

TOTAL MATERIALS (2)..... $522

This includes the following: tree at $4.00 each, mulching materials, tree protectors, water, fertilizer, weed oil, pest control materials, and miscellaneous supplies.

TOTAL CASH CULTURAL COSTS (3)..... $800

This includes labor, field power, and materials for the first year.

TOTAL CASH OVERHEAD COSTS (4)..... $196

Cash overhead costs include general expense items such as postage, telephone, insurance, office, publications, membership dues, laboratory fees, etc.; management charge or the fee paid to a grove manager supervising the development of a grove for a grower, county property taxes, and maintenance and repair costs for building and equipment.

TOTAL PREHARVEST CASH COSTS (5)..... $996

This includes all cash costs for labor, materials, and cash overhead expenses. Because there is no fruit credits to apply against these costs, this figure represents the NET CASH COSTS for the first year.

TOTAL INVESTMENT COSTS $469

The investment costs include depreciation on irrigation system, buildings, and equipment. Depreciation is figured by dividing the per acre costs by years of life. Trees are not depreciated until they start to produce, generally the 4th or 5th year. Total first year depreciation for above items is $119.

TOTAL NET ALL COSTS (9)..... $1,465

For sake of uniformity, most farm advisors developing cost data for avocados use an assumed land value of $3,000 per acre. We realize, of course, most land can not be purchased for that and that each parcel of land has two values--its agricultural value and its speculative value. Interest on investment is based only on the agricultural value and not on some future use for the land.

TOTAL INVESTMENT VALUE (12)..... $5,466

The total investment value (including labor, field power, materials, overhead cost, land at $3,000, trees, irrigation system, building and equipment at $1,120) for the first 5 years is as follows:

1st - $5,466
2nd - 6,169
3rd - 6,890
4th - 7,375
5th - 7,822

Fruit credits for fourth and fifth year production at .25 and .50 field box (10 and 20 pounds) respectively at 20 cents per pound has been applied.

ANNUAL COSTS

After seeing how we got $7,822 investment value per acre, you have a pretty good idea as to how easy it is to spend $1,293 per acre per year to raise a crop.

Refer to the attached AVOCADO PRODUCTION COSTS FOR VENTURA COUNTy.

TOTAL CULTURAL COSTS..... $162

This includes labor and materials for the following cultural practices. Fertilization: applying 150 pounds of actual nitrogen per acre in two applications, a zinc foliage spray plus the cost of having a leaf analysis. Irrigation: applying 2.5 acre-feet of water in 12 applications. Pest Control: applying snail bait, rat poison, gopher traps, and chlordane for ant control. Weed control: applying one application of residual herbicide plus two spot sprays of contact materials. Pruning includes removing deadwood, skirt pruning, and tree shaping.

Orchard thinning is required between the 8th and 12th year and the total cost of $720 per acre is prorated over 10 years for an annual cost of $72 per acre. Miscellaneous includes tree care, erosion control, props, etc.

TOTAL OVERHEAD COSTS..... $231

This includes taxes at $110 per acre, maintenance and repairs, general expense, and management charge. Items included in these have already been discussed.

TOTAL PRE-HARVEST CASH COSTS..... $559

TOTAL INVESTMENT OVERHEAD..... $734

This includes depreciation at $334 and interest on investment at $400. The investment schedule is given on page 2 of the study.

RETURNS

You now know about how much you are going to spend per acre per year to raise avocados. Let's find out if you're going to make any profit. Remember, you have already received a fair return on your investment and a moderate wage for your labor. To make a profit, you'll have to make more than $1,293 per acre. How much you make is dependent upon yield and returns per pound.

Yield varies considerably from year to year and orchard to orchard. Commercial production may range from 3,000 to 12,000 pounds per acre. Excellent orchards under favorable conditions produce more. The following chart illustrates variability in years on tree-returns due to yield and price regardless of variety.

On-Tree Price*	Yield per Acre in Pounds						
per Pound	3,000	5,000	6,000	7,000	8,000	10,000	12,000
$0.10	$ 300	$ 500	$ 600	$ 700	$ 800	$ 1,000	$ 1,200
0.15	450	750	900	1,050	1,200	1,500	1,800
0.20	600	1,000	1,200	1,400	1,600	2,000	2,400
0.25	750	1,250	1,500	1,750	2,000	2,500	3,000
0.30	900	1,500	1,800	2,100	2,400	3,000	3,600
0.35	1,050	1,750	2,100	2,450	2,800	3,500	4,200

*Net to grower after harvest costs and marketing order assessment of 4.5%

YIELD PER ACRE FROM SELECTED MATURE HIGH-YIELDING COMMERCIAL AVOCADO ORCHARDS IN CALIFORNIA[1]

Variety & Orchard No.	No. Acres[2]	1965-66	1966-67	1967-68	1968-69	1969-70	5-year Average[3]	High	Low
Hass									
8	4	14,000	11,325	7,925	15,800	7,750	11,667 (6 yr)	15,800	7,750
9	5	27,800	480	8,840	22,520	6,520	13,368 (10 yr)	27,800	480
10	10	14,600	6,520	12,200	15,000	10,520	10,280 (6 yr)	15,000	6,520
11	10	20,960	9,400	14,440	13,480	5,640	12,320 (6 yr)	20,960	5,640
12	20	18,209	7,444	8,408	10,063	6,423	10,109	18,209	6,423
13	10	20,995	4,057	14,260	1,813	2,635	8,752	20,995	1,813
14	16	12,667	5,850	6,060	6,717	8,696	7,998	12,667	5,850
15	46	17,143	6,218	9,020	7,135	6,484	7,898 (11 yr)	17,143	6,218

1. Sample orchards located in San Diego, Riverside, Orange, and Ventura Counties
2. Number of acres in sample orchard
3. Except as noted

Source: Grower records

(Taken from Expansion in the California avocado industry, Agricultural Extension, U. C., Riverside 1973)

From the chart about 6,500 pounds at 20 cents per pound will return $1,300 per acre. To project how much your production will be is not easy, but you can do three things: (1) check the state averages, (2) check the county average, and (3)interpolate according to known producing orchards in your area.

(1) State average 1965-72 - 5,457 pounds per acre
(2) County average 1968-72 - 5,860 pounds per acre
(3) Good producing orchards - see chart attached.

The Hass variety is the major variety planted in Ventura County. High yielding Hass orchards from the chart ranged from a low average of 7,898 (11 years) to a high of 13,368 (10 years) pounds per acre. The low average orchard ranged from 6,218 pounds on the low to 17,143 pounds on the high. The high average orchard ranged from 480 pounds on the low to 27,800 on the high.

Price per pound is likewise difficult to project. The avocado does follow the supply-demand curve in relation to supply. A large supply results in lower returns. A small supply results in larger returns. In Ventura County returns per pound from 1968 to 1972 were 23.0, 15.0, 33.0, 22.3, and 54.1 cents per pound respectively. The average was 29.4 cents per pound.

1/1974 - 600c

AVOCADO ORCHARD DEVELOPMENT COSTS

VENTURA COUNTY

Sample costs have been estimated on the basis of a new 10-acre planting in Ventura County. Hass variety, planted 18 x 22' or 110 trees per acre, relatively frost-free site, permanent plastic irrigation system, and non-tilled.

Water costs vary, depending on source. Range is from $10 to $60 per acre-foot. Average for county is $18 per acre-foot.

Assessed values and tax rates vary by districts. Range is from $75 to $135 per acre. Tree values are usually added after the fourth year.

Fruit credit varies, depending on yields and prices. Assumed yields are .25 and .5 field boxes per tree for fourth and fifth years respectively. On-tree price 20 cents per pound.

Initial capital outlay is estimated at $4,120 per acre based on an assumed land cost of $3,000 per acre and $1,120 per acre for the irrigation system, pickup, building, and equipment. The initial cost of the irrigation system is estimated at $650 per acre installed. At the beginning of the third year, the spitter heads are usually replaced with rotating sprinklers at an additional cost of $100 per acre. For simplification, irrigation system costs are shown as an initial cost only.

Interest on investment for the first year equals 7 percent of the total cost per acre (line 5) plus 7 percent of land value and undepreciated balance of irrigation system, equipment, and building. Interest for remaining years equals 7 percent of prior-year total investment value (12).

Investment in trees at end of year equals accumulated net costs (11) of prior years.

Investment value for items is original cost, less accumulated depreciation.

AVOCADO ORCHARD DEVELOPMENT COSTS

VENTURA COUNTY

	DOLLARS PER ACRE				
	1st yr.	2nd yr.	3rd yr.	4th yr.	5th yr.
Labor and Field Power					
Land preparation	$ 35	-	-	-	-
Orchard layout	20	-	-	-	-
Plant (dig, plant, mulch, wrap)	82	3	1	-	-
Irrigation	60	45	36	36	36
Fertilization	18	12	6	6	6
Weed control (hoe, oil, herbicide)	18	12	9	9	9
Pest control	12	9	6	6	6
Tree care and pruning	18	15	15	15	18
Miscellaneous (erosion control, etc.)	15	12	9	6	6
(1) Total Labor and Power	$ 278	$ 108	$ 82	$ 78	$ 81
Materials					
Trees (110 trees/acre @ $4.00)	$ 440	16	4	-	-
Mulch	20	-	-	-	-
Tree protectors	11	-	-	-	-
Water a/	12	18	24	36	48
Fertilizer	3	6	10	13	20
Weed oil and herbicides	20	23	23	23	23
Pesticides	6	4	4	6	8
Miscellaneous (supplies)	10	10	10	10	10
(2) Total Materials	$ 522	$ 77	$ 75	$ 88	$ 109
(3) Total Cash Cultural	$ 800	$ 185	$ 157	$ 166	$ 190
Cash Overhead					
General expense	$ 80	19	16	17	19
Management charge	36	36	36	36	36
Taxes b/	60	60	60	80	110
Maintenance and repair	20	20	20	20	20
(4) Total Cash Overhead	$ 196	$ 135	$ 132	$ 153	$ 185
(5) Total Preharvest Cash Costs	$ 996	$ 320	$ 289	$ 319	$ 375
(6) Less Fruit Credits c/	-	-	-	$ 220	$ 440
(7) Net Cash Costs	$ 996	$ 320	$ 289	$ 99	$ 65+
Investment Costs					
Depreciation d/	$ 119	$ 119	$ 119	$ 119	$ 119
Interest on investment	350	383	432	482	516
(8) Total Precash Costs	$ 469	$ 502	$ 551	$ 601	$ 635
(9) Total Net All Costs	$1,465	$ 822	$ 840	$ 700	$ 570
(10) Accumulated Total Net Costs	$1,465	$2,287	$3,127	$3,727	$4,297
(11) Accumulated Net Cash Costs	$ 996	$1,316	$1,605	$1,704	$1,639
INVESTMENT VALUE AT END OF YEAR					
Land @ $3,000	$3,000	$3,000	$3,000	$3,000	$3,000
Trees	1,465	2,287	3,127	3,727	4,297
Irrigation System $650) - $1,120 Equipment and bldgs. 470)	$1,001	$ 882	$ 763	$ 644	$ 525
(12) Total Investment Value	$5,466	$6,169	$6,890	$7,371	$7,822

B. W. Lee, R. C. Rock
1/1974 - 500c

AVOCADO PRODUCTION COSTS

VENTURA COUNTY

BASIS FOR STUDY

The figures listed in this sample cost of production study are based on assumed conditions. The typical practices are listed, with sample costs given for labor, materials, and equipment. These are not average costs, but are intended as guidelines. Individual orchards may vary considerably from these figures in their costs and returns.

Sample Costs in this report are based on a typical mature commercial ten-acre owner-operated orchard of mainly Hass avocados planted 18 x 22 feet or 110 trees per acre on a moderate slope hillside with permanent plastic pipe sprinkler irrigation system and with no frost protection equipment.

Wage Rate is $3.00 per hour including fringe benefits.

Pruning consists of removing skirt limbs to allow for water distribution from sprinklers and removal of broken branches, deadwood, suckers, and cutting wild growth to control shape.

Orchard Thinning of temporary trees is required as trees crowd. The first thinning at 8 to 12 years of age removes half the total trees. Additional thinning may be required 4 to 6 years later.

Harvest Costs vary from 1½ to 4 cents per pound, depending on tree size, yield per tree, terrain, etc.

Marketing is through independent or cooperative packinghouses. An assessment of 4.5 to 5 percent of the value of crop at roadside is made for sales promotion and production research.

YIELDS AND RETURNS

Yield varies considerably among orchards and from year to year. Commercial production may range from 3,000 to 12,000 pounds per acre. Excellent orchards under favorable conditions produce more. The following chart illustrates variability in gross on-tree returns due to yield and price changes for all varieties.

On-Tree Price*	Yield per Acre in Pounds						
per Pound	3,000	5,000	6,000	7,000	8,000	10,000	12,000
$0.10	$ 300	$ 500	$ 600	$ 700	$ 800	$ 1,000	$ 1,200
0.15	450	750	900	1,050	1,200	1,500	1,800
0.20	600	1,000	1,200	1,400	1,600	2,000	2,400
0.25	750	1,250	1,500	1,750	2,000	2,500	3,000
0.30	900	1,500	1,800	2,100	2,400	3,000	3,600
0.35	1,050	1,750	2,100	2,450	2,800	3,500	4,200

* Net to grower after harvest costs and marketing order assessment of 4.9%

VENTURA COUNTY YIELDS AND RETURNS

	Acreage		Ave. Yield	Gross	Total
Year	Total	Bearing	Lbs/Acre	Cents/Lb	Value
1968	3,372	2,785	8,350	23.0	$ 3,883,000
1969	3,867	2,947	7,150	15.0	2,159,000
1970	3,638	3,070	5,000	33.0	5,056,000
1971	4,296	3,155	5,200	22.3	3,673,000
1972	4,862	3,279	3,600	54.1	6,369,700
		Average	5,860	29.4	$ 4,228,140

INVESTMENT SCHEDULE

Depreciation and interest on investment are included in this study. An annual charge for interest on investment is calculated on the money invested in land, trees, buildings, and equipment. The charge is at a rate of 7 percent on assumed agricultural land value of $3,000 per acre plus half life on trees, equipment, and buildings.

Depreciation and interest per acre are calculated from the following investment schedule.

Item	Expected Life	Per-Acre Costs Investment	Depreciation	Interest
Land	-	-	-	$210.00
Trees (110/acre)	20 years	$4,297	$214.85	150.39
Irrigation System	10 years	650	65.00	22.75
Pickup	5 years	150	30.00	5.25
Buildings and miscellaneous.	20 years	120	4.00	4.20
Weed sprayer, hand tools	10 years	200	20.00	7.00
Total Investment Schedule		$5,417	$333.85	$399.59

COST ANALYSIS PER ACRE

Cultural Operations

	Labor	Material and Equipment	Total
Fertilizer			
Nitrogen - 2 times, 1.5 lbs N/tree	$ 6	$ 20	$ 26
Zinc spray and leaf analysis	9	6	15
Irrigation - 12 times, water 2.5 ac-ft/acre	36	60	96
Pest control - snails, rodents, ants	9	29	38
Weed Control			
Herbicide	3	3	6
Spot oil - 2 times	6	12	18
Pruning - skirt, dead wood, shaping	9	3	12
Orchard thinning - 10-year proration	48	24	72
Miscellaneous - tree care, erosion, etc.	36	9	45
Total Cultural Costs	$162	$166	$328

Overhead Costs

Taxes	$ 110
Maintenance and repairs	40
General Expense	45
Management Charge	36
Total Cash Overhead Costs	$ 231
Total Preharvest Cash Costs	$ 559

Investment Overhead

Depreciation	$ 334
Total Cash Costs Plus Depreciation	$ 893
Interest on Investment	$ 400
Total Preharvest Costs	$1,293

B. W. Lee
Robert C. Rock
1/1974 - 600c

AVOCADO CASH FLOW CHART

VENTURA COUNTY

THIS CHART IS BASED ON THE AVOCADO PRODUCTION COSTS DATA SHEET TO SHOW APPROXIMATE MONTHLY OUTFLOW OF EXPENSES DURING THE PRODUCTION YEAR.

Agricultural Extension
University of California
684 Buena Vista Street
Ventura, California 93001

AVOCADO - CASH FLOW - VENTURA COUNTY

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
CULTURAL OPERATIONS													
Fertilization 2x	$	$	$	$	$	$	$	$	$	$	$	$	$
Labor.....	-	3.00	-	-	-	-	3.00	-	-	-	-	-	6.00
Material.....	-	10.00	-	-	-	-	10.00	-	-	-	-	-	20.00
Zinc Spray	-	-	-	-	-	13.50	-	-	1.50	-	-	-	15.00
Irrigation 12x													
Labor.....	-	-	-	-	3.00	6.00	6.00	6.00	6.00	6.00	3.00	-	36.00
Water.....	-	-	-	-	5.00	10.00	10.00	10.00	10.00	10.00	5.00	-	60.00
Pest Control.....	-	-	9.50	-	-	9.50	-	-	9.50	-	-	9.50	38.00
Weed Control													
Herbicide 1x.....	-	-	-	-	-	-	-	-	-	-	6.00	-	6.00
Spot Oil 2x.....	-	-	-	9.00	-	-	-	-	9.00	-	-	-	18.00
Pruning.....	-	-	-	-	-	-	-	12.00	-	-	-	-	12.00
Orchard Thinning.....	-	-	-	-	-	-	-	-	72.00	-	-	-	72.00
Miscellaneous.....	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75	45.00
Total	$ 3.75	$16.75	$13.25	$ 12.75	$ 11.75	$ 42.75	$ 32.75	$ 31.75	$111.75	$ 19.75	$ 17.75	$ 13.25	$328.00
CASH OVERHEAD													
Taxes.....	-	-	-	55.00	-	-	-	-	-	-	-	55.00	110.00
Maintenance & Repair..	3.33	3.33	3.33	3.33	3.33	3.33	3.33	3.33	3.33	3.33	3.33	3.33	40.00
General Expense.....	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75	45.00
Management Charge.....	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	36.00
Total	$10.08	$10.08	$10.08	$ 65.08	$ 10.08	$ 10.08	$ 10.08	$ 10.08	$ 10.08	$ 10.08	$ 10.08	$ 65.08	$231.00
TOTAL ALL CASH COSTS	13.83	26.83	23.33	77.83	21.83	52.83	42.83	41.83	21.83	29.83	27.83	78.33	559.00
ACCUMULATED CASH COST	13.83	40.66	63.99	141.82	163.65	216.48	259.31	301.14	422.97	452.80	480.63	558.96	559.00

B. W. Lee, [illegible]rm Advisor
1/1974 - 6[illegible]
UC Cooperative Extension