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Avocado Production Costs

San Diego County

DESCRIPTION

In San Diego County the cost of producing avocados varies with the grower and the orchard. A recent study developed through the cooperative effort of growers, farm managers, and the University of California far advisor showed that the total pre-harvest costs, which include the cultural, non-cash and overhead costs, were $14,048 per acre to produce avocados.

Sample costs in this study are based on a typical commercial 10-acre avocado orchard, 10- to 12-year old trees, 100 trees per acre, planted on a hillside and utilizing a permanent, plastic sprinkler or drip irrigation system. Costs will vary from orchard to orchard and from district to district and from varieties planted. "For instance, Hass trees require up to twice as much nitrogen as Fuertes, Zutano, Bacon and Reed. The figures in this study are not presented as "standard" costs, but are intended as guideline costs. Also these figures reflect the costs if a farm management company is managing the orchard."

The operating cost figure includes irrigation, fertilization, weed control, pest control, pruning, orchard thinning, maintenance and operation of equipment, taxes, insurance, management fee, general expense, interest on investment, and depreciation. Investment per acre includes the sprinkler/drip system, trees, building and equipment, and miscellaneous items such as hand and shop tools. Depreciation per acre is on the sprinkler/drip system, trees (after 5 years of growth), buildings, truck, mower, and hand tools.

Irrigation constitutes the largest single expense of the agricultural operation totalling $1,180 per acre. Water use averages 3-1/2 acre feet per acre at $230 per acre foot for a cost of $805. Labor required to irrigate approximately 40 times during the year costs $375. Not only is irrigation the largest single expense, but the most important operation the grower must do in the orchard.

Fertilization with nitrogen totals $195 per acre. Nitrogen applied in the chemical form costs $140. Approximately 150 pounds of actual nitrogen per acre is used. Labor applying the material is $55, giving a total for material and labor of $195. Zinc may be needed from time to time. This may be applied to the leaves by aerial spraying (airplane or helicopter) or ground spraying, or applied on the ground. Zinc is applied once every three-five years to the soil. Soil application requires a larger dosage than a foliage spray in order to supply the tree with an adequate amount of this material. A large dosage, therefore, lasts for the period up to five years. The foliage spray will have to be done once every year. Phosphorus and potassium may be applied periodically as leaf analysis indicates. The fertilizer costs in this study include leaf analysis once a year.

Other operational costs are: weed control at $150, using Round-up and Simazine on a spot-spraying basis, and the use of a tractor mower for mowing the weeds or grass,

pest control totals $105 per acre, which is the cost of controlling ants, gophers, snails, and rodents; pruning cost $140 per acre, which consist of removing dead wood, lifting the skirts of the trees to permit better water distribution, and brush removal; orchard thinning, beginning between the 10th and 15th year, costs an average of $25 per tree; maintenance and operation of equipment includes repairs, supplies, erosion control, etc. and totals $100 per acre. Breakdown of the total cultural costs are as follows: Materials and equipment $1,410 and $775 for labor, giving a total of $2,185 per acre.

Harvest costs vary from $.04 to $.10 per pound depending on the tree size, size of crop, terrain, etc. A 4.7% assessment is made on the value of the crop at roadside. This money is used for industry advertising, sales promotion, and production research.

Operating overhead costs include: taxes at $275 per acre, general expenses (insurance, office supplies, telephone) of $225 per acre, and maintenance and repairs of $225 per acre. Management fees are variable, but $10 per acre per month is the usual charge. The fee increases yearly. This gives a total of $845 per acre overhead cost. The management fee is placed in the study since many growers use grove managers and/or a grove management service. Whenever a grower utilizes an orchard management service he is paying a fee of so much a month per acre for supervision. The total pre-harvest cost (cultural and overhead costs) comes to a total of $3,030 per acre. The non-cash cost, including depreciation at $7,003 per acre and interest on investment of $4,015 adds $11,018 to the pre-harvest cost of $3,030 per acre. This brings a total of $14,048 per acre. For growers not wanting to charge interest on investment as a cost against the orchard, subtract the $4,015 from $14,048 which leaves a pre-harvest cost of $10,033 per acre.

Yield per acre varies by different varieties, locations, cultural practices, type of tree and climatic conditions from year to year. Good commercial yields per acre for Fuerte and Bacon should range from 6,000 to 10,000 pounds; Hass, Reed, and Zutano from 7,000 to 12,000 pounds. In some years, under favorable weather conditions, some orchards have produced exceptionally high yields, up to 20,000 to 30,000 pounds per acre.

The accompanying table shows the breakdown of costs which should be given consideration in figuring the cost of producing an acre of avocados.

INVESTMENT OVERHEAD PER ACRE

Depreciation and interest on investment is included as overhead costs of the investment. An annual charge for interest on investment is calculated on the money invested in land, buildings, and equipment. The charge is at a rate of 15% on assumed land value of $8,000 per acre plus half life value on trees, equipment and buildings.

The total economic cost of producing avocados includes a charge for interest since the value of your capital should not be ignored in measuring orchard income, and for comparison with alternate use of resources. For management analysis, non-cash costs (including interest and owner's labor) should be included, even though they are not included as business expenses in accounting practices.

Yield varies considerably among orchards, and from year to year. Commercial production may range from 5,000 to 15,000 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	Yields Per Acre Pounds/Acre						
Cents/lb.	3,000	5,000	6,000	7,000	8,000	10,000	15,000
$0.15	$ 450	$ 750	$ 900	$1,050	$1,200	$ 1,500	$ 2,250
0.20	600	1,000	1,200	1,400	1,600	2,000	3,000
0.25	750	1,250	1,500	1,750	2,000	2,500	3,750
0.30	900	1,500	1,800	2,100	2,400	3,000	4,500
0.35	1,050	1,750	2,100	2,450	2,800	3,500	5,250
0.40	1,200	2,000	2,400	2,800	3,200	4,000	6,000
0.50	1,500	2,500	3,000	3,500	4,000	5,000	7,500
0.60	1,800	3,000	3,600	4,200	4,800	6,000	9,000
0.70	2,100	3,500	4,200	4,900	5,600	7,000	10,500

* Deduct cost of harvesting - 4¢ to 10¢ per pound.

Depreciation and interest per acre are calculated from the following Investment Schedule:

ITEM	EXPECTED LIFE	ACRS ***	INVESTMENT PER ACRE	DEPRECIATION (ACRS)
Land $8,000 (assumed value)	-	-	$ 8,000	-
Trees (100/acre)	20 years	5 years	31,840	$6,366
Irrigation System	10 years	5 years	2,000	400
Pickup ($5,000 new)	5 years	3 years	500	167
Buildings ($1,500)	10 years	5 years	150	30
Hand tools/Mower ($2,000)	10 years	5 years	200	40
TOTAL INVESTMENT			$42,690	$7,003

** ACRS Depreciation Schedule used.

COST ANALYSIS

Cultural Operations	Labor Cost	Materials and Equipment Cost	Total Cost Per Acre
Fertilizer-2x/year (Actual N 150 lb/ac - hand applied)	$ 55	$ 140	$ 195
Fertilizer through irrigation system			
Drip Irrigation (wkly.- 10 mos.)	50	135	185
Sprinkler (biwkly.-10 mos.)	30	100	130
Irrigation-40x/year-Sprinkler (Water required-3½ ac.ft./acre-$230)	375	805	1,180
Reduce water use with daily application through Drip Irrigation			
Pest Control-ants,gophers,snails, rodents (bait,poison,predators)	55	50	105

COST ANALYSIS

Cultural Operations (Continued)	Labor Cost	Materials and Equipment Cost	Total Cost Per Acre
Weed Control-hand,spot spraying and/or mowing	$ 50	$ 100	$ 150
Pruning-skirt,deadwood-orchard thinning (tree removal at 10-15 yrs or tree stumping) $25/tree-chain saw and brush disposal	100	40	140
Miscellaneous-tree care,erosion control, supplies,tree stakes,tools, etc.	60	40	100
TOTAL CULTURAL COSTS	$ 775	$ 1,410	$2,185

Overhead Costs

Taxes	$ 275
Maintenance and Repairs	225
General Expenses	225
Management Charge ($10/acre/mo.- Amount increases yearly)	120
TOTAL CASH OVERHEAD COSTS	$ 845
TOTAL CULTURAL COSTS	2,185
TOTAL PRE-HARVEST CASH COSTS	$ 3,030

Investment Overhead

Total Pre-harvest Cash Costs plus Depreciation	$ 3,030
Depreciation	7,003
Interest on Investment	4,015
TOTAL PRE-HARVEST COSTS (depreciation and interest on investm't.incl)	$14,048

Note: We acknowledge the fine cooperation and assistance of the growers and San Diego County farm managers who participated in accumulation of this cost data.

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Avocado Orchard Development Costs

San Diego County

DESCRIPTION

The cost figures given in the study are based on assumed conditions. Typical practices are listed with sample costs given for labor, materials and equipment required. These are not presented as "standard" costs but are intended as guidelines. Individual orchards may vary considerably from these figures in their cost and return experience, and whether they are operated by the grower or a farm management company. The figures in this study are based upon a farm management company managing the orchard.

Orchards on steep slopes with inadequate roadways and drives for fruit hauling and grove work will cost more to operate and maintain. The type of irrigation system selected may have a lower initial cost, but higher labor requirements and maintenance costs resulting in higher irrigation costs as the orchard matures. Poor or untimely farming and management practices commonly cause costs to be higher than necessary.

Weed control is an operation that can be costly if treatments are delayed or poorly done. If weed control has been neglected, or weed control adjacent to the planted area is included, costs will be much higher. Elimination of a weed problem is more costly than maintenance of a normal weed control program. Delayed weed control is often the cause of costs being higher than expected.

Sample costs in this study are on the basis of the following: 1) a ten-acre avocado orchard, planted 20' x 20' tree distance, and 100 trees per acre; 2) hillside planting and relatively frost-free; 3) orchard located within a water district furnishing Colorado River water; 4) utilizing a permanent underground, plastic (PVC rigid pipe) conventional irrigation system, adaptable to fixed and rotating sprinklers and drip/trickle systems, with a riser to each tree; and 5) all costs are on a per acre basis.

Varieties commonly planted and the suggested planting distances are: Fuerte (20'x 20' or 108 trees/acre); Hass and Reed (15' x 20' or 145 trees/acre); and Zutano and Bacon (15' x 15' or 190 trees/acre). The Study Costs are for 100 trees per acre. Estimates indicate costs could increase 35% on greater than 30^0 slopes.

Water costs will vary, depending upon the source (wells or water district), district assessments, water meter charge, back flow check valves, water availability charge, etc. Water costs range from $125 to $300/acre foot and more if pumping charges are added. Check with your water district for all charges.

County taxes are assessed when the trees reach five years of age from the date of planting. There will be a variation in tax charges, depending upon the area location of the orchard.

Fruit credits vary, depending upon the variety planted, tree yields (production), fruit quality, weather conditions and market prices. Serious wind and cold conditions can drastically affect fruit production for three to four years.

Harvest costs range from $.04 to $.10 per pound. Total harvest costs include transportation, supervision, fuel for equipment, poles, clippers, bags, ladders, bins, boxes, and other items such as steepness of slope, height of trees, size of crops, etc. Marketing order assessment for Production Research is 0.2%. Avocado Commission assessment for advertising and promotion is 4.5%. The total percentage figure of 4.7% is determined on the value of the crop at the packing house door.

The study shows figures for the first, second, third, fourth and fifth years. Included will be the labor and field power necessary, the materials, cash overhead, fruit credits, and the allocation of monies for land, trees, irrigation system, building, and equipment.

The labor and field power include the following: land preparation, orchard layout, planting (holes and protectors), irrigation, fertilization, weed control (hoe and spray), mulching (wood chips), tree care and pruning, pest control (gophers, rabbits, squirrels, etc.), and miscellaneous (repairs, erosion control). The first year's total labor and power cost is $1,990. The big item in this first year was the land preparation, consisting of subsoiling to a depth of two to three feet, disking, land movement where necessary, and finally, floating of the land. In the second year, land preparation and orchard layout were not needed expenditures so the total was $695 an acre. In the third year, land preparation, orchard layout and planting of replacement trees were items eliminated, which gave a total of $592 an acre. The fourth year, $560 was the cost, and the fifth year ended up at $560 an acre. The total labor and power for the five years was $4,397 per acre.

Total materials for the first year cost $1,390, and included trees at $8 per tree, water, mulching materials, fertilizer, pest control, baits, poison and traps, tree wraps, weed oil, and miscellaneous parts and supplies. The largest item, of course, in the first year was the purchase of 100 trees.

In the second year, the materials cost $550 an acre; and the third year $635 an acre; the fourth year $630 an acre; and the fifth year $775 an acre, for the total of $3,980 per acre.

The total cash cultural costs, including labor, field power, and materials for the first year was $3,380; for the second year $1,245; for the third year $1,227; for the fourth year $1,190; and for the fifth year $1,335 for a total of $8,377.

The cash overhead includes general expense items (postage, telephone, insurance, magazines, etc.), management charge (a fee paid to a grove manager supervising the development of a grove for a grower), taxes and maintenance and repair. The total cash overhead for the first year is $900; second year $595; third year $604; fourth year $599; and fifth year $620, for a five-year total of $3,321.

The total pre-harvest costs per acre the first year were $4,280; the second year $1,840; the third year $1,831; the fourth year $1,709, and the fifth year $1,955 for a five-year total of $11,618.

For the Fuerte variety, there should be some fruit credit obtained in the fourth and fifth years, and in some rare cases, the third year. For the Hass variety, fruit credits may be obtained the second and third years. Fruit credit varies, depending upon tree yields and market prices.

INVESTMENT

Capital outlay is estimated to be $10,850 per acre based upon an assumed land cost of $8,000 per acre, and $2,850 per acre for the irrigation system, equipment and buildings. Permanent plastic irrigation system fixed sprinkler (spitter) heads are installed the first year at a cost of $2,000. During the fourth to fifth year, the spitter heads can be converted to revolving sprinklers at an additional cost. For drip irrigation systems, the same basic permanent rigid PVC plastic system can be used. Flexible PVC hoses are attached to each tree riser with four one-gallon-per-hour emitters per tree. Sand and screen filters and a fertilizer tank are installed when a drip irrigation system is used.

To simplify calculations in the table, the initial capital outlay of $2,850 per acre includes a charge for the complete irrigation system.

Interest on investment for the first year equals 15% of the first year total preharvest cash cost per acre (Line 5), plus 15% of land value (Line 14), plus the 15% of the undepreciated balance of irrigation systems, equipment and buildings (Line 16).

Calculations

Pre-harvest Cost (Line 5) = $4,283 x 15% =	$ 643
Land Value (Line 14) = $8,000 x 15% =	1,200
Undepreciated Balance of Total Value = $2,850	
(1st year Undepreciated Balance = $2,213 x 15% = $332)	332
Irrigation System $2,000	
Equipment 700	
Buildings 150	
Total Equip.Costs $2,850 (Line 16) - $637 (Line 9) = $2,213	
Total Interest on Investment (Line 10)	$2,175

Interest for remaining years equals 15% of prior year total investment costs (Line 17). This amount is placed in Line 10 to be added to Non-Cash Costs (Line 11).

Total Investment Cost - 1st Year $17,308 x 15% = $2,596. This figure ($2,596) is placed in 2nd Year column (Line 10), and added to Depreciation (Line 9). These two items (Lines 9 & 10) become the Total Non-Cash Costs (Line 11).

Investment in the trees at the end of the year equals Accumulated Total Net Costs of prior years (Line 13). Investment Cost is the original cost of $2,850 less the annual depreciation of $637.

The Net Cash Costs (Line 7) includes labor and field power, materials and cash overhead (less Fruit Credits in 3rd, 4th, and 5th years) and come to $4,283 the first year; $1,840 the second; $1,331 for the third year; $589 for the fourth year; and $155 for the fifth year.

The total investment value at the end of the first year (including labor and field power, materials, overhead cost, land at $8,000 per acre, trees, irrigation system, buildings and equipment) is $17,308; for the second year $21,744; $26,837 at the end of the third year; $32,652 at the end of the fourth year; and at the end of the fifth year, a total of $39,840.

Note: We acknowledge the fine cooperation and assistance of the growers and the San Diego County farm managers who participated in the accumulation of this cost data.