

**COSTS FOR ESTABLISHING AND PRODUCING WALNUTS
LATE-LEAFING TERMINAL BEARING
SOUTHERN SAN JOAQUIN VALLEY - 1985**

Prepared by:

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1. Yield:

Yield (lbs/acre)	<u>Year</u>				
	4	5	6	7	Mature
Early Leafing Lateral Bearing	300	700	1200	2000	3500
Late Leafing Lateral Bearing	300	700	1200	2000	3500
Late Leafing Terminal Bearing			400	900	3500

2. Acreage:

The cost studies are based on a 60 acre orchard of which 3 acres are for roads and burn areas.

3. Spacing:

Terminal bearing orchards are spaced 35' by 35' with 35 trees per acre. Lateral bearing orchards are planted 28' by 28' with 55 trees per acre.

4. Varieties

A cost of establishment and a cost of production study was developed for each of three walnut variety types; (1) early-leafing lateral bearing, (2) late-leafing lateral bearing and (3) late-leafing terminal bearing. There are several differences among variety types that affect costs, labor and equipment requirements and yield. The most significant difference is the number of trees per acre; terminal-bearing trees are planted fewer to the acre than lateral-bearing. For the late-leafing varieties less pesticide applications are made than for the early-leafing varieties. Terminal bearing trees require less pruning per tree than lateral bearing trees. Of course, terminal bearing varieties bear more slowly than early leafing varieties. This is reflected in the establishment cost studies in the fifth, sixth and seventh years. The differences in production practices among the three variety types will be explained in detail.

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5. Irrigation:

A pipeline irrigation system is used. The first three years are flood irrigated. Borders are put up after that and the centers are mowed. Water applications rates are as follows:

Year	Acres Feet/Year
1	1
2	1
3	1.5
4	2
5	3
6	3
7	3.5
8+	4.0

6. Fertilizer:

The rate of nitrogen applied is as follows:

Year	Lbs/Acre
1	6
2	12
3	27
4	54
5	54
6	108
7	108
8+	150

7. Pesticides:

Early Leafing - 1 spray years 3-5, 2 sprays year 6, 4 sprays year 7 and on.

Late Leafing - 1 spray in the 4th year and then 1 spray every other year.
(lateral and terminal bearing)

8. Pruning:

Starting in year 5 a pruning tower is rented.

Year	Lateral Bearing (early-leafing and late-leafing)	Terminal Bearing (late-leafing)
	-----Hours/Acre-----	
1	0.5	0.33
2	1	0.67
3	2	0.67
4	3	1
5	2	1
6	3	1.2
7	3	1.2
8+	4	1.2

9. Brush removal:

Brush is removed by hand in establishment years. After that a shredder is used.

10. Harvest:

The first bearing year is hand-picked with the picker receiving half the crop. Following years are mechanically harvested. The custom rate includes a one ton minimum charge.

11. Interest:

An interest rate of 13% was assumed. Operating capital is assumed to be borrowed for 6 months of each establishment and producing year. Interest is also charged on accumulated cash costs in establishment years to reflect interest charged on a long-term establishment loan. Interest is also charged on investment capital to account for the income foregone by keeping money tied up in capital equipment.

12. Overhead Costs:

County taxes represent a set fee while office and business costs are estimated at about 8% of the total cultural costs. They include such costs as preparing roadways, general weed control, office, bookkeeping, etc.

13. Fuel & Repair:

Included are the cost of fuel, maintenance, replacement parts, tires, etc.

14. Investment Cost:

In allocating the equipment cost per acre, the following calculations were made: (a) "Original Cost" of equipment is the estimated new cost and includes 6% sales tax. (b) "Cost Per Acre" is the new cost divided by the number of acres the equipment will be used on. (c) "Depreciation" is based on the "Per Acre Cost" divided by the expected life of the equipment. (d) "Interest" on investment is figured on one-half of the new cost per acre multiplied by 13%. (e) The investment cost per acre is calculated as 60% of the cost of all new equipment to reflect a mix of new and used equipment.

15. Land is valued at \$6000 per acre. An interest rate of 13% is applied.

English Walnut Orchard Establishment Costs
Late Leafing Terminal Bearing
Southern San Joaquin Valley - 1985
Cost Analysis Work Sheet

Costs are for an orchard planted 35' x 35', with 35 trees per acre. A pipeline irrigation system is used.

Skilled Labor \$ 7.50
Field Labor \$ 5.75

-----Costs Per Acre-----							
YEAR	1st	2nd	3rd	4th	5th	6th	7th
YIELD: lbs./acre in-shell						400	900
CULTURAL COSTS:							
Land Preparation: subsoil contract	160						
Disk and Float: 4 hours labor and tractor	73						
Trees: 35 @ \$0.5 (+1 2nd Yr. and 1 3rd Yr.)	298	9	9				
Survey and Plant: 35 @ \$1.00 2nd and 3rd Yrs. \$3.	35	3	3				
Prune and Train (skilled hand labor)	2	5	5	7	28	33	33
Brush disposal	3	6	6	8	8	19	19
Tillage and Irrigation Preparation: 7hrs. yrs. 1-3 1 hr. yrs. 4+	127	127	127	18	18	18	18
Put up borders				30			
Mow middles				41	41	41	41
Spray: weed control				27	27	27	27
Irrigation: 4hrs. labor 1st 2 yrs., 6 hrs. 3rd yr., 1hr. 4+ yrs.	23	23	35	6	6	6	6
Water: \$14 ac. ft. plus \$6 acre district tax	20	20	27	34	48	48	48
Fertilizer: Nitrogen .33/Lb. .5 hr. labor and tractor	7	7	7	7	7	7	7
Spray: pest control materials Custom application				19		19	
Misc. labor and power, 1hr. labor and tractor	15	15	15	15	15	15	15
TOTAL CULTURAL COSTS	765	216	241	244	215	283	250
HARVESTING COSTS:							
Handpick-\$.35/lb. for half crop						70	
1st Pick-80% removal, \$120/ton, 1 ton minimum							120
2nd Pick, \$70/acre							70
Hull and Dry \$70/ton						14	32
TOTAL HARVESTING COSTS						84	222

YEAR	1st	2nd	3rd	4th	5th	6th	7th
OVERHEAD COSTS:							
County taxes	60	60	60	60	60	120	120
Office and Business Costs	61	17	19	19	17	23	20
TOTAL OVERHEAD COSTS	121	77	79	79	77	143	140
TOTAL CASH COSTS	886	295	320	323	293	509	611
ACCUMULATED CASH COSTS	886	1181	1501	1824	2117	2626	3238
DEPRECIATION:							
Building, equipment, and irrigation system	77	77	77	77	77	77	77
INTEREST ON INVESTMENT @ 13%							
Building, equipment, and irrigation system	63	63	63	63	63	63	63
Land \$6000	780	780	780	780	780	780	780
Interest in accum. cash cost	115	154	195	237	275	341	421
TOTAL INTEREST ON INVESTMENT	958	997	1038	1080	1118	1185	1264
TOTAL COST FOR THE YEAR	1921	1369	1435	1477	1488	1771	1952
CREDIT FOR PRODUCTION							
.35/LB. in-shell						140	315
NET COST FOR THE YEAR	1921	1369	1435	1477	1488	1631	1637
ACCUMULATED NET COST	1921	3289	4725	6202	7690	9321	10958

SAMPLE COSTS TO PRODUCE ENGLISH WALNUTS

Late Leafing Terminal Bearing
Southern San Joaquin Valley - 1985

Labor rate \$ 7.50 /hr. skilled labor
5.75 /hr. field labor
Yield: 3500 Lbs. of dry nuts per acre

Operation	Labor Hours per Acre	Labor	Cash and Fuel & Repairs	Labor Costs per Acre Kind and Quantity	Materials Cost	Total Cost	Your Cost
Cultural costs:							
Pruning	1.2	9.00		Tower Rental \$20/hr.	24.00	33.00	
Brush Disposal	1.2	9.00	9.60			18.60	
Fertilizer				150 lbs. N @ \$.33/lb.	49.50	49.50	
				Custom application	6.00	6.00	
Spray: Pest Control every other year				Materials \$19./spray	9.50	9.50	
				Custom app. \$14/spray	7.00	7.00	
Tillage and irrig. prep	1	5.75	12.00			17.75	
Irrigation 7X	1	5.75		3.5 ac.ft. @ \$14.00/ac. ft. + \$6.00 tax	55.00	60.75	
Spray: weed control						26.80	
Mow 5X	2.5	18.75	22.50			41.25	
Misc.	1	7.50	7.00			14.50	
Interest on operating capital @ 13%						37.00	
TOTAL CULTURAL COSTS	7.9	55.75	51.10		151.00	321.65	
Harvest costs:							
1st Pick - 80% of crop				\$120/ton, 1 ton minimum	168.00	168.00	
2nd Pick - 20%				\$70/acre	70.00	70.00	
Hull and Dry				\$70/ton	122.50	122.50	
TOTAL HARVEST COSTS						360.50	
Cash overhead:							
Office and business costs						54.57	
County Taxes						120.00	
TOTAL CASH OVERHEAD COSTS						174.57	
TOTAL CASH COSTS						856.73	
TOTAL CASH COSTS PER TON						489.56	
Investment							
	Per Acre			Annual Cost			
				Depreciation	Interest @ 13%		
Equipment & buildings	971.00			76.77	63.12	139.89	
Trees 40 yr. depreciation	10958.00			273.95	712.27	986.22	
Land	6000.00				780.00	780.00	
TOTAL INVESTMENT COSTS	17929.00			350.72	1555.39	1906.11	
TOTAL COSTS PER ACRE						2762.84	
Cost per ton @ 3500 lbs. yield						1578.76	

**Cost of Producing Walnuts at Varying Yields
Late Leafing Terminal Bearing**

	POUNDS PER ACRE								
	1000	1500	2000	2500	3000	3500	4000	4500	5000
Cultural costs	321.65	321.65	321.65	321.65	321.65	321.65	321.65	321.65	321.65
Harvest cost	225.00	242.50	260.00	277.50	319.00	360.50	402.00	443.50	485.00
Cash overhead	163.73	165.13	166.53	167.93	171.25	174.57	177.89	181.21	184.53
Total cash cost	710.38	729.28	748.18	767.08	811.90	856.72	901.54	946.36	991.18
Investment cost	1899.00	1899.00	1899.00	1899.00	1899.00	1899.00	1899.00	1899.00	1899.00
Total cost	2609.38	2628.28	2647.18	2666.08	2710.90	2755.72	2800.54	2845.36	2890.18

Income Above Cash Costs at Varying Yields & Prices

CENTS PER POUND	POUNDS PER ACRE								
	1000	1500	2000	2500	3000	3500	4000	4500	5000
25	-460.38	-354.28	-248.18	-142.08	-61.90	18.28	98.46	178.64	258.82
30	-410.38	-279.28	-148.18	-17.08	88.10	193.28	298.46	403.64	508.82
35	-360.38	-204.28	-48.18	107.92	238.10	368.28	498.46	628.64	758.82
40	-310.38	-129.28	51.82	232.92	388.10	543.28	698.46	853.64	1008.82
45	-260.38	-54.28	151.82	357.92	538.10	718.28	898.46	1078.64	1258.82
50	-210.38	20.72	251.82	482.92	688.10	893.28	1098.46	1303.64	1508.82
55	-160.38	95.72	351.82	607.92	838.10	1068.28	1298.46	1528.64	1758.82
60	-110.38	170.72	451.82	732.92	988.10	1243.28	1498.46	1753.64	2008.82

Income Above Total Costs at Varying Yields & Prices

CENTS PER POUND	POUNDS PER ACRE								
	1000	1500	2000	2500	3000	3500	4000	4500	5000
25	-2359.38	-2253.28	-2147.18	-2041.08	-1960.90	-1880.72	-1800.54	-1720.36	-1640.18
30	-2309.38	-2178.28	-2047.18	-1916.08	-1810.90	-1705.72	-1600.54	-1495.36	-1390.18
35	-2259.38	-2103.28	-1947.18	-1791.08	-1660.90	-1530.72	-1400.54	-1270.36	-1140.18
40	-2209.38	-2028.28	-1847.18	-1666.08	-1510.90	-1355.72	-1200.54	-1045.36	-890.18
45	-2159.38	-1953.28	-1747.18	-1541.08	-1360.90	-1180.72	-1000.54	-820.36	-640.18
50	-2109.38	-1878.28	-1647.18	-1416.08	-1210.90	-1005.72	-800.54	-595.36	-390.18
55	-2059.38	-1803.28	-1547.18	-1291.08	-1060.90	-830.72	-600.54	-370.36	-140.18
60	-2009.38	-1728.28	-1447.18	-1166.08	-910.90	-655.72	-400.54	-145.36	109.82

ENGLISH WALNUT ORCHARD
Southern San Joaquin Valley - 1985

EQUIPMENT AND BUILDING LIST

ITEM	ORIGINAL COST	ANNUAL USE (ACRES)	COST PER ACRE	LIFE (YEARS)	OVERHEAD DEPREC- IATION	INTEREST AT 13%	COST PER HOUR
Tractors:							
55 HP wheel diesel	30000	60	500.00	10	50.00	32.50	7.00
Disk, tandem 14'	7500	60	125.00	10	12.50	8.13	3.60
Float	2000	60	33.33	10	3.33	2.17	.96
Mower	4000	60	66.67	10	6.67	4.33	2.00
Brush Rake	1000	60	16.67	15	1.11	1.08	1.00
Brush Shredder	7600	60	126.67	10	12.67	8.23	4.00
Weed Sprayer SP	9000	60	150.00	10	15.00	9.75	11.30
Pipeline Irrigation System	24000	60	400.00	20	20.00	26.00	
Buildings	12000	60	200.00	30	6.67	13.00	
TOTAL COST	97100		1618.33		127.94	105.19	
60% OF NEW COSTS	58260		971.00		76.77	63.12	

LATE-LEAFING TERMINAL BEARING WALNUT PRODUCTION CASH FLOW ANALYSIS

PER ACRE MONTHLY CASH COST/CULTURAL PRACTICE CALENDAR

PRODUCTION YEAR: NOVEMBER-OCTOBER

MONTH

PRACTICE	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	TOTAL
PRUNING			33.00										33.00
BRUSH DISPOSAL			18.68										18.68
FERTILIZER							27.75			27.75			55.50
INSECT CONTROL ^{1/}								16.50					16.50
TILLAGE & IRRIGATION PREP											17.75		17.75
IRRIGATION				6.75		6.75	6.75	13.50	13.50	6.75	6.75		60.75
HERBICIDE ^{2/}	20.00						6.80						26.80
MOW				8.25		8.25	8.25	8.25			8.25		41.25
MISCELLANEOUS						7.25						7.25	14.50
INTEREST ON OPERATING CAPITAL ^{3/}	2.60		6.72	1.95		2.96	6.44	5.53	1.76	4.49	4.26	1.01	37.72
HARVEST ^{4/}												360.50	360.50
CORPORATE TAXES		60.00				60.00							120.00
OFFICE & BUSINESS COSTS	4.55	4.55	4.55	4.55	4.55	4.55	4.55	4.55	4.55	4.55	4.55	4.55	54.60
TOTAL	27.15	64.55	62.95	21.50	4.55	39.76	60.54	48.33	19.81	43.54	41.56	373.31	857.55

^{1/} Insect Control - spray every other year \$16.50 = 1/2 total cost

^{2/} Preemergence Nov. Contact May

^{3/} Rate 13% on preharvest cash costs

^{4/} 3,500 lbs/acre