

1988 HEDGEROW WALNUT ORCHARD - SAMPLE PRODUCTION COSTS  
Northern San Joaquin Valley

by

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This cost study provides detailed information on the sample costs of producing hedgerow walnuts in the northern San Joaquin Valley. Costs are projected for hypothetical 20 acre orchard with 2 non-producing acres for buildings, roads, ditches, burn area, etc. The 20 acre hedgerow orchard is assumed to be part of a 150 acre tree fruit and nut operation.

This study contains five tables and a List of General Assumptions. The tables include an eight year Establishment Cost Worksheet, a Cost of Production Worksheet, a Monthly Summary of Sample Costs, an Equipment List, and a Ranging Analysis showing returns over costs at varying yields and prices. Costs given in this sample study are for those of a typical well-managed orchard and are not intended to reflect an average of all orchards in the northern San Joaquin Valley.

Practices listed are based on those production procedures considered typical for this crop and area. Sample costs given for labor, materials, equipment and contract services are based on 1988 figures. Some costs or practices listed in this study may not be applicable to your situation. Production costs for walnuts can vary based on a number of factors including age of orchard, spacing of trees, type of irrigation system, annual variations in pest pressure and differing management practices. This study is intended only as a guide and can be used as an aid in making production decisions, determining potential returns, preparing budgets and evaluating production loans. A blank "Your Costs" column is provided to enter your actual costs on the Cost of Production Worksheets.

For explanation of calculations used for the study refer to the attached list of General Assumptions or call Agricultural Economics Extension, University of California, Davis, California, (916) 752-2745, or call the farm advisor in the county of interest.

GENERAL ASSUMPTIONS FOR PRODUCING HEDGEROW WALNUTS  
Northern San Joaquin Valley - 1988

The following list describes the general assumptions pertaining to hedgerow walnut production costs in the northern San Joaquin Valley.

1. Land and trees:

Bare land value (22 acres):	\$4,000/acre
Establishment costs (180 Trees/acre - 11' X 22'):	\$8,000/acre

Since only 20 of the 22 total acres are in production, the land value per acre needs to be adjusted to \$4400 per producing acre. To obtain the annual costs for depreciation, the establishment costs are divided by 25 years. Land is not depreciated. Interest on the investment in land and trees is calculated by multiplying the interest rate (10%) by the average value of land and trees. The average value of the trees is estimated to be one-half of the establishment costs.

Some cultural practices and costs depend on the walnut variety and rootstock used. This study assumes the use of nursery-grafted trees of an early- or mid- leafing variety on Paradox hybrid rootstock.

2. Labor rates: (include 27% for SDI ,FICA, insurance, and other benefits)

Machinery operators:	\$7.00/hr
Semi-skilled labor:	\$5.75/hr
Irrigators & misc. labor:	\$5.40/hr

To account for maintenance and repair time, labor hours for operations involving machinery are 10% higher than the machine hours.

3. Equipment costs:

In allocating the equipment costs per acre, the following calculations were made: (a) "Original Cost" of equipment is the new cost including sales tax. (b) "Depreciation" is straight line with no adjustment for Salvage Value. It is calculated by dividing new cost per acre by the years to trade. (c) "Interest" on investment is figured as one-half of the new cost per acre multiplied by the interest rate. One-half of the new cost is the average value of the equipment during its useful life. (d) The investment per acre used in the cost study is calculated at 60% of the depreciation and interest costs for all new equipment to reflect a mix of new and used equipment.

4. Office and business costs include phone, office supplies, accounting fees, etc.

5. County taxes are calculated at 1% of land at acquisition plus 1% of the average assessed value of trees, equipment, buildings and improvements.

6. Equipment insurance is calculated at 1.0% of equipment costs.

7. Pickup costs are based on 10,000 miles/year of operation at \$0.35/mile for a new truck.
8. Supervisory fees are not included in this cost study.
9. Irrigation assumptions:  
7 irrigations at 7 inches per irrigation - 49 acre inches/year total.  
25 hp Pump. Capacity: 400 gal/min.  
Electricity costs @ 50% plant efficiency = \$20.83/acre foot.
10. Interest on operating capital is based on accumulated cash costs until payment is received after harvest.
11. Included in "Miscellaneous" are costs for hoeing weeds, crown gall treatment, rodent control, etc.

SAMPLE COSTS TO ESTABLISH HEDGEROW WALNUTS  
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Skilled labor:	\$7.00 per hour	Interest rate:	10.0%
Semi-skilled labor:	\$5.75 per hour		
Field labor:	\$5.40 per hour		

YEAR	Costs per Acre							
	1st	2nd	3rd	4th	5th	6th	7th	8th
YIELD (Pounds/acre)				1,000	2,000	4,000	5,500	6,000
<b>Planting costs</b>								
Pre-plant fumigation	\$350							
Land preparation, survey, mark	95							
Tree stakes @ \$1.25/stake	225							
Plant, water, set stakes	100							
Trees - 100 @ \$12.00	2,160							
<b>TOTAL PLANTING COSTS</b>	<b>\$3,010</b>							
<b>Cultural costs:</b>								
Training, tie, prune	\$25	\$150	\$150	\$75	\$46	\$46	\$46	\$46
Brush removal	0	0	0	4	8	12	17	17
Blight spray	0	0	0	72	72	72	84	84
Fertilize	10	15	30	45	55	55	55	55
Mow	0	0	0	37	37	37	37	37
Cooling moth sprays	0	0	0	75	75	75	75	75
Mite spray	0	0	0	36	36	36	36	36
Irrigation water @ \$21/ac. ft. + R&M	45	53	61	69	77	85	93	93
Irrigation labor	9	9	9	9	9	9	9	9
Strip weed spray	0	12	25	25	25	25	25	25
Tillage	100	100	100	0	0	0	0	0
Hoe weeds	12	6	4	2	1	1	1	1
Replants	0	151	75	0	0	0	0	0
Miscellaneous	10	10	16	16	16	22	22	22
Pick-up costs	40	40	30	20	20	20	20	20
<b>TOTAL CULTURAL COSTS</b>	<b>\$251</b>	<b>\$546</b>	<b>\$500</b>	<b>\$485</b>	<b>\$477</b>	<b>\$495</b>	<b>\$520</b>	<b>\$520</b>
<b>Harvesting Costs:</b>								
Custom				95	190	380	523	570
<b>TOTAL HARVEST COSTS</b>				<b>\$95</b>	<b>\$190</b>	<b>\$380</b>	<b>\$523</b>	<b>\$570</b>
<b>Overhead Costs:</b>								
Office and business costs	20	20	20	20	20	20	20	20
County Taxes	51	51	51	51	70	90	110	131
Insurance	7	7	7	7	7	7	7	7
<b>TOTAL OVERHEAD COSTS</b>	<b>\$78</b>	<b>\$78</b>	<b>\$78</b>	<b>\$78</b>	<b>\$97</b>	<b>\$117</b>	<b>\$137</b>	<b>\$158</b>
<b>TOTAL CASH COSTS</b>	<b>\$3,339</b>	<b>\$624</b>	<b>\$578</b>	<b>\$658</b>	<b>\$764</b>	<b>\$992</b>	<b>\$1,180</b>	<b>\$1,248</b>
<b>ACCUMULATED CASH COSTS</b>	<b>\$3,339</b>	<b>\$3,963</b>	<b>\$4,541</b>	<b>\$5,199</b>	<b>\$5,963</b>	<b>\$6,955</b>	<b>\$8,135</b>	<b>\$9,383</b>

Costs per Acre

YEAR	1st	2nd	3rd	4th	5th	6th	7th	8th
Depreciation:								
Building & equipment	65	65	65	65	65	65	65	65
<b>TOTAL DEPRECIATION</b>	<b>\$65</b>	<b>\$65</b>	<b>\$65</b>	<b>\$65</b>	<b>\$65</b>	<b>\$65</b>	<b>\$65</b>	<b>\$65</b>
Interest on Investment at 10%								
Building & equipment	37	37	37	37	37	37	37	37
Land \$4400/acre	440	440	440	440	440	440	440	440
Interest on accumulated cash costs	334	396	454	520	596	696	813	938
<b>TOTAL INTEREST ON INVESTMENT</b>	<b>\$811</b>	<b>\$873</b>	<b>\$931</b>	<b>\$997</b>	<b>\$1,073</b>	<b>\$1,173</b>	<b>\$1,290</b>	<b>\$1,415</b>
<b>TOTAL COST FOR THE YEAR</b>	<b>\$4,215</b>	<b>\$1,562</b>	<b>\$1,575</b>	<b>\$1,720</b>	<b>\$1,902</b>	<b>\$2,230</b>	<b>\$2,535</b>	<b>\$2,728</b>
<b>CREDIT FROM HARVEST @ \$0.40/POUND</b>				<b>\$400</b>	<b>\$600</b>	<b>\$1,600</b>	<b>\$2,200</b>	<b>\$2,400</b>
<b>NET COST FOR THE YEAR</b>	<b>\$4,215</b>	<b>\$1,562</b>	<b>\$1,575</b>	<b>\$1,320</b>	<b>\$1,102</b>	<b>\$630</b>	<b>\$335</b>	<b>\$328</b>
<b>TOTAL ACCUMULATED NET COST</b>	<b>\$4,215</b>	<b>\$5,777</b>	<b>\$7,352</b>	<b>\$8,672</b>	<b>\$9,774</b>	<b>\$10,403</b>	<b>\$10,738</b>	<b>\$11,067</b>

SAMPLE COSTS TO PRODUCE HEDGEROW WALNUTS  
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Labor Rate:	\$7.00/hr. skilled labor	Interest Rate:	10%
	\$5.75/hr. semi-skilled labor		
	\$5.40/hr. field labor	Yield (tons/acre):	3.0

Operation	Tractor/ Implement No.	Implement No.	Hours	Cash and Labor Costs per Acre				Total Cost	Your Cost
				Labor Cost/A	Fuel & Repairs	Material Cost	Custom /Rent		
Cultural costs:									
Pruning 180 Trees/acre	9		8.0	\$46				\$46	
Brush Removal	1	7	.5	14	\$3			17	
Blight Sprays 3X	1	5	1.5	12	33	\$40		84	
Fertilize 2X-125# N @ \$.20	1		.4	3	2	50		55	
Mow 6X	1	6	2.4	18	19			37	
Codling moth spray 2X	1	5	1.0	8	22	45		75	
Mite spray	1	5	.5	4	11	21		36	
Irrigation (7 X 7")	12	13	58.8		8	85		93	
Labor			1.8	9				9	
Strip weed spray	1	8	.3	2	2	21		25	
Miscellaneous			4.0	22				22	
Costs for pick up truck					20			20	
Interest on operating capital @ 10%								40	
<b>TOTAL CULTURAL COSTS</b>			79	\$138	\$120	\$261		\$560	

Harvest Costs:									
Custom								\$570	\$570
TOTAL HARVEST COSTS								\$570	\$570

Cash overhead:									
Office and business costs								\$20	
County Taxes								131	
Equipment Insurance								7	
TOTAL CASH OVERHEAD COSTS								\$159	
TOTAL CASH COSTS								\$1,289	
TOTAL CASH COST/TON:			3 tons/acre					\$433	

Investment	Per production Acre	Annual Cost		
		Depreciation	Interest @ 10%	
Land @ \$4,000/acre (bare)	\$4,400		\$440	\$440
Equipment & buildings	746	\$65	37	102
Trees (25 yr. depreciation)	8,000	320	400	720
TOTAL INVESTMENT COSTS		\$ 13,146	\$385	\$877
TOTAL COSTS PER ACRE				\$2,551
TOTAL COST/TON:			3 tons/acre	\$850

MONTHLY SUMMARY OF  
SAMPLE COSTS TO PRODUCE HEDGEROW WALNUTS

Northern San Joaquin Valley - 1988

Operation	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	TOTAL
Cultural costs:													
Pruning	46												\$46
Brush Removal			17										17
Blight Sprays 3X			28	56									84
Fertilize 2X			28				28						55
Mow 6X				6	6	6	6	6	6				37
Codling moth spray 2X					37	37							75
Mite spray							36						36
Irrigation (7 X 7")				13	13	13	13	13	13	13			93
Labor				1	1	1	1	1	1	1			9
Weed spray										25			25
Miscellaneous				5	5		5	5					22
Costs for pick up	2	2	2	2	2	2	2	2	2	2	2	2	20
Int.operating capital		1	1	2	3	4	4	5	10	10			40
<b>TOTAL CULTURAL COSTS</b>	<b>\$48</b>	<b>\$2</b>	<b>\$76</b>	<b>\$87</b>	<b>\$68</b>	<b>\$63</b>	<b>\$96</b>	<b>\$33</b>	<b>\$32</b>	<b>\$52</b>	<b>\$2</b>	<b>\$2</b>	<b>\$560</b>
Harvest Costs:													
Custom									570				570
<b>TOTAL HARVEST COSTS</b>									<b>\$570</b>				<b>\$570</b>
Cash overhead:													
Office and business	2	2	2	2	2	2	2	2	2	2	2	2	20
County Taxes				66								66	131
Equipment Insurance	7												7
<b>TOTAL CASH OVERHEAD</b>	<b>\$9</b>	<b>\$2</b>	<b>\$2</b>	<b>\$67</b>	<b>\$2</b>	<b>\$2</b>	<b>\$2</b>	<b>\$2</b>	<b>\$2</b>	<b>\$2</b>	<b>\$2</b>	<b>\$67</b>	<b>\$159</b>
<b>TOTAL CASH COSTS</b>	<b>\$57</b>	<b>\$4</b>	<b>\$77</b>	<b>\$154</b>	<b>\$70</b>	<b>\$65</b>	<b>\$97</b>	<b>\$34</b>	<b>\$604</b>	<b>\$53</b>	<b>\$3</b>	<b>\$69</b>	<b>\$1,289</b>

EQUIPMENT AND BUILDING LIST FOR HEDGEROW WALNUTS  
Northern San Joaquin Valley - 1988

Interest Rate: 10%

Fuel Cost per Gallon \$ .70 diesel  
\$.90 gasoline

ITEM #	DESCRIPTION	NEW COST	ANNUAL USE (ACRES)	COST PER ACRE	YEARS TO LIFE (HRS)	YEARS ---OVERHEAD*---		120%	--- HOURLY COSTS ---			
						TRADE	DEPREC- IATION		TAR*	FUEL*	REPAIRS*	TOTAL
Tractors:												
1	60 HP wheel diesel	\$25,000	150	\$167	12,000	15	\$11.11	\$8.33	120	\$2.81	\$2.50	\$5.31
2	60 HP wheel diesel	25,000	150	167	12,000	15	11.11	8.33	120	2.81	2.50	5.31
3	Disc 8'	5,000	150	33	2,500	15	2.22	1.67	100		2.00	2.00
4	Float 8'	2,750	150	18	2,500	15	1.22	.92	160		1.10	1.10
5	PTO sprayer, 500 gal.	35,000	150	233	2,500	10	23.33	11.67	120		16.80	16.80
6	Flail mower, 8 foot	4,000	150	27	2,000	10	2.67	1.33	120		2.40	2.40
7	Buck Rake	1,500	150	10	2,500	15	.67	.50	100		.60	.60
8	Weedsprayer 250 gal	2,000	150	13	1,200	10	1.33	.67	100		1.67	1.67
9	Ladders & Pruning equip.	1,200	150	8		10	.80	.40	100			
10	Truck, 1 1/2 ton	17,500	150	117	2,000	8	14.58	5.83	80			
11	Pick-up, 1/2 ton	10,000	150	67	2,000	5	13.33	3.33	60			
12	Flood irrigation system	45,000	150	300	125,000	15	20.00	15.00	36		.13	.13
13	Irrigation pump (25 HP)	6,000	150	40	175,000	20	2.00	2.00	36		.01	.01
	Shop and tools	4,000	150	27		10	2.67	1.33				
	Chemical building	2,500	150	17		35	.40	.83				
TOTAL COST		\$186,450		\$1,243			\$108	\$62				
60% OF NEW COSTS*		\$111,870		\$746			\$65	\$37				

\* DEFINITIONS:

- YEARS TO TRADE----- The projected life of the machine in years adjusted for excessive annual use.
  - OVERHEAD ----- Per acre per year.
  - DEPRECIATION ----- "COST PER ACRE" divided by "YEARS TO TRADE"
  - INTEREST----- ("COST PER ACRE" X "INTEREST RATE") divided by 2=average interest cost per acre per year.
  - TAR----- Total accumulated repairs. The total cost of repairs during machine's life expressed as percent of "NEW COST". Calculated from equations based on equipment type and annual use.
  - HOURLY COST OF FUEL----- Diesel fuel, oil and lube costs per hour = HP x cost of diesel fuel/gal X 0.0667.  
Gasoline fuel, oil and lube costs per hour = HP x cost of gasoline/gal X 0.0889.
  - HOURLY COST OF REPAIRS-- ("NEW COST" X "TAR") divided by ("LIFE IN HOURS").
  - 60% OF NEW COSTS ----- Used to reflect a mix of new and used equipment.
- UC Cooperative Extension



COST TO PRODUCE HEDGEROW WALNUTS AT VARYING PRICES AND YIELDS

	YIELD (Pounds/acre)						
	3000	4000	5000	6000	7000	8000	9000
Cultural Costs	560	560	560	560	560	560	560
Harvest Costs	285	380	475	570	665	760	855
Cash Overhead	159	159	159	159	159	159	159
Cash cost/acre	1,004	1,099	1,194	1,289	1,384	1,479	1,574
Cash cost/ton	669	549	477	430	395	370	350
Investment cost	1,262	1,262	1,262	1,262	1,262	1,262	1,262
TOTAL COST/ACRE	2,266	2,361	2,456	2,551	2,646	2,741	2,836
TOTAL COST/TON	1,510	1,180	532	850	756	685	630

INCOME ABOVE CASH COSTS AT VARYING PRICES AND YIELDS

\$ per Pound	YIELD (Pounds/acre)						
	3000	4000	5000	6000	7000	8000	9000
.30	-104	101	306	511	716	921	1,126
.35	46	301	556	811	1,066	1,321	1,576
.40	196	501	806	1,111	1,416	1,721	2,026
.45	346	701	1,056	1,411	1,766	2,121	2,476
.50	496	901	1,306	1,711	2,116	2,521	2,926
.55	646	1,101	1,556	2,011	2,466	2,921	3,376
.60	796	1,301	1,806	2,311	2,816	3,321	3,826

INCOME ABOVE ALL COSTS AT VARYING PRICES AND YIELDS

\$ per Pound	YIELD (Pounds/acre)						
	3000	4000	5000	6000	7000	8000	9000
.30	-1,366	-1,161	-956	-751	-546	-341	-136
.35	-1,216	-961	-706	-451	-196	59	314
.40	-1,066	-761	-456	-151	154	459	764
.45	-916	-561	-206	149	504	859	1,214
.50	-766	-361	44	449	854	1,259	1,664
.55	-616	-161	294	749	1,204	1,659	2,114
.60	-466	39	544	1,049	1,554	2,059	2,564