

WN-VN-90-2

WALNUTS
Hedgerow

**NORTHERN
SAN JOAQUIN
VALLEY**

1990



by

*Joseph A. Grant
Lonnie Hendricks
Kathy Kelley
Karen Klonsky*

*University of California
Cooperative Extension*

1990 HEDGEROW WALNUT ORCHARD - SAMPLE PRODUCTION COSTS Northern San Joaquin Valley 1990

by

Joseph A. Grant, Farm Advisor, San Joaquin County
Lonnie Hendricks, Farm Advisor, Merced County
Kathy Kelley, Farm Advisor, Stanislaus County
Karen Klonsky, Extension Specialist, U. C. Davis

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 **Sample Costs to Establish Hedgerow Walnuts**, a **Sample Costs to Produce Hedgerow Walnuts**, a **Monthly Summary of Sample Costs**, an **Equipment and Building 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 1990 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 Karen Klonsky, Department of Agricultural Economics, University of California, Davis, California, (916) 752-3563, or call the farm advisor in the county of interest.

GENERAL ASSUMPTIONS FOR PRODUCING HEDGEROW WALNUTS
Northern San Joaquin Valley - 1990

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
Land value per production acre (20 acres)	\$4,400/production acre
Cash establishment costs (180 trees/acre - 11' x 22')	\$9,383

Since only 20 of the 22 total acres are in production, the land value per acre needs to be adjusted to \$4,400 per producing acre. To obtain the annual costs for depreciation, the accumulated cash 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 by the average value of land and trees. The average value of the trees is estimated to be one-half of the cash 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-leaving variety on Paradox hybrid rootstock.

2. Labor rates: (includes 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

Labor hours:

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

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. Refer to the **Equipment and Building List** for details.

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 acre per irrigation - 49 acre inches per acre 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. **Miscellaneous costs** include hoeing weeds, crown gall treatment, rodent control, etc.

UC COOPERATIVE EXTENSION

SAMPLE COSTS TO ESTABLISH HEDGEROW WALNUTS
Northern San Joaquin Valley - 1990

Skilled labor: \$7.00 per hour Interest rate: 11.0%
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
Planting costs								
Pre-plant fumigation	\$350							
Land preparation, survey, mark	95							
Tree stakes @ \$1.25/stake	225							
Plant, water, set stakes	180							
Trees - 180 @ \$12.00	2,160							
TOTAL PLANTING COSTS	\$3,010							
Cultural costs:								
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
Codling 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
TOTAL CULTURAL COSTS	\$251	\$546	\$500	\$485	\$477	\$495	\$520	\$520
Harvesting Costs:								
Custom				95	190	380	523	570
TOTAL HARVEST COSTS				\$95	\$190	\$380	\$523	\$570
Overhead Costs:								
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
TOTAL OVERHEAD COSTS	\$78	\$78	\$78	\$78	\$97	\$117	\$137	\$158
TOTAL CASH COSTS	\$3,339	\$624	\$578	\$658	\$764	\$992	\$1,180	\$1,248
ACCUMULATED CASH COSTS	\$3,339	\$3,963	\$4,541	\$5,199	\$5,963	\$6,955	\$8,135	\$9,383

Costs per Acre

	1st	2nd	3rd	4th	5th	6th	7th	8th
Depreciation:								
Building & equipment	65	65	65	65	65	65	65	65
TOTAL DEPRECIATION	\$65	\$65	\$65	\$65	\$65	\$65	\$65	\$65
Interest on Investment at:								
	11:0%							
Building & equipment	36	36	36	36	36	36	36	36
Land	484	484	484	484	484	484	484	484
Interest on accumulated cash costs	367	436	500	572	656	765	895	1,032
TOTAL INTEREST ON INVESTMENT	\$887	\$956	\$1,020	\$1,092	\$1,176	\$1,285	\$1,415	\$1,552
TOTAL COST FOR THE YEAR	\$4,291	\$1,645	\$1,663	\$1,815	\$2,005	\$2,342	\$2,659	\$2,865
CREDIT FROM HARVEST @ \$0.40/POUND				\$400	\$800	\$1,600	\$2,200	\$2,400
NET COST FOR THE YEAR	\$4,291	\$1,645	\$1,663	\$1,415	\$1,205	\$742	\$459	\$465
TOTAL ACCUMULATED NET COST	\$4,291	\$5,936	\$7,599	\$9,014	\$10,219	\$10,961	\$11,420	\$11,885

UC COOPERATIVE EXTENSION

SAMPLE COSTS TO PRODUCE HEDGEROW WALNUTS
Northern San Joaquin Valley - 1990

Labor Rate:	\$7.00/hr. skilled labor	Interest Rate:	11%
	\$5.75/hr. semi-skilled labor		
	\$5.40/hr. field labor	Yield (tons/acre):	3.0

Operation	Tractor/ Implement No.	Implement No.	Hours	Labor Cost/A	Fuel & Repairs	Material Cost	Cash and Labor Costs per Acre Custom /Rent	Total Cost	Your Cost
Cultural costs:									
Pruning 180 Trees/acre	8		8.0	\$46				\$46	
Brush Removal	1	6	.5	14	\$3			17	
Blight Sprays 3X	1	4	1.5	12	33	\$40		84	
Fertilize 2X-125# N @ \$.20	1		.4	3	2	50		55	
Mow 6X	1	5	2.4	18	19			37	
Codling moth spray 2X	1	4	1.0	8	22	45		75	
Mite spray	1	4	.5	4	11	21		36	
Irrigate 7x-7 acre in. ea.	11	12	58.8		8	85		93	
Labor			1.8	9				9	
Strip weed spray	1	7	.3	2	2	21		25	
Miscellaneous			4.0	22				22	
Costs for pick up truck					20			20	
Interest on operating capital @ 11%								44	
TOTAL CULTURAL COSTS			79	\$138	\$120	\$261		\$564	

Harvest Costs:									
Custom		\$190 per ton						\$570	\$570
TOTAL HARVEST COSTS								\$570	\$570

Cash overhead:									
Office and business costs									\$20
County Taxes									144
Equipment Insurance									6
TOTAL CASH OVERHEAD COSTS								\$171	

TOTAL CASH COSTS								\$1,305	
TOTAL CASH COST/TON:		3 tons/acre						\$435	

Investment	Per production Acre	Annual Cost Depreciation	Interest @ 11%	Total
Land	\$4,400		\$484	\$484
Equipment & buildings	646	\$58	36	93
Trees (25 yr. depreciation)	9,383	375	516	891
TOTAL INVESTMENT COSTS		\$ 14,429	\$433	\$1,036
				\$1,469

TOTAL COSTS PER ACRE								\$2,774	
TOTAL COST/TON:		3 tons/acre						\$925	

MONTHLY SUMMARY OF
SAMPLE COSTS TO PRODUCE HEDGEROW WALNUTS

Northern San Joaquin Valley - 1990

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
Irrigate 7x				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	1	3	3	4	5	5	11	11			44
TOTAL CULTURAL COSTS	\$48	\$2	\$76	\$87	\$69	\$64	\$96	\$33	\$33	\$53	\$2	\$2	\$564
Harvest Costs:													
Custom									570				570
TOTAL HARVEST COSTS									\$570				\$570
Cash overhead:													
Office and business	2	2	2	2	2	2	2	2	2	2	2	2	20
County Taxes				72								72	144
Equipment Insurance	6												6
TOTAL CASH OVERHEAD	\$8	\$2	\$2	\$74	\$2	\$2	\$2	\$2	\$2	\$2	\$2	\$74	\$171
TOTAL CASH COSTS	\$56	\$4	\$78	\$161	\$70	\$66	\$98	\$35	\$605	\$54	\$3	\$75	\$1,305

UC COOPERATIVE EXTENSION

EQUIPMENT AND BUILDING LIST FOR HEDGEROW WALNUTS
Northern San Joaquin Valley - 1990

Interest Rate: 11%

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

ITEM #	DESCRIPTION	NEW COST	ANNUAL USE (ACRES)	COST PER ACRE	LIFE (HRS)	YEARS TO TRADE	----OVERHEAD*----		--- HOURLY COSTS ---			
							DEPRECIATION	INTEREST*	TAR*	FUEL*	REPAIRS*	TOTAL
Tractors:												
1	60 HP wheel diesel	\$25,000	150	\$167	12,000	15	\$11.11	\$9.17	120%	\$2.81	\$2.50	\$5.31
2	Disc 8'	5,000	150	33	2,500	15	2.22	1.83	100		2.00	2.00
3	Float 8'	2,750	150	18	2,500	15	1.22	1.01	100		1.10	1.10
4	PTO sprayer, 500 gal.	35,000	150	233	2,500	10	23.33	12.83	120		16.80	16.80
5	Flail mower, 8 foot	4,000	150	27	2,000	10	2.67	1.47	120		2.40	2.40
6	Buck Rake	1,500	150	10	2,500	15	.67	.55	100		.60	.60
7	Weedsprayer 250 gal	2,000	150	13	1,200	10	1.33	.73	100		1.67	1.67
8	Ladders & Pruning equip.	1,200	150	8		10	.80	.44	100			
9	Truck, 1 1/2 ton	17,500	150	117	2,000	8	14.58	6.42	80			
10	Pick-up, 1/2 ton	10,000	150	67	2,000	5	13.33	3.67	60			
11	Flood irrigation system	45,000	150	300	125,000	15	20.00	16.50	36		.13	.13
12	Irrigation pump (25 HP)	6,000	150	40	175,000	20	2.00	2.20	36		.01	.01
	Shop and tools	4,000	150	27		10	2.67	1.47				
	Chemical building	2,500	150	17		35	.48	.92				
TOTAL COST		\$161,450		\$1,076			\$96	\$59				
60% OF NEW COSTS*		\$96,870		\$646			\$58	\$36				

* 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.

COST TO PRODUCE HEDGEROW WALNUTS AT VARYING PRICES AND YIELDS

	YIELD (Pounds/acre)						
	3000	4000	5000	6000	7000	8000	9000
Cultural Costs	564	564	564	564	564	564	564
Harvest Costs	285	380	475	570	665	760	855
Cash Overhead	171	171	171	171	171	171	171
Cash cost/acre	1,020	1,115	1,210	1,305	1,400	1,495	1,590
Cash cost/ton	680	557	484	435	400	374	353
Investment cost	1,469	1,469	1,469	1,469	1,469	1,469	1,469
TOTAL COST/ACRE	2,489	2,584	2,679	2,774	2,869	2,964	3,059
TOTAL COST/TON	1,659	1,292	1,071	925	820	741	680

INCOME ABOVE CASH COSTS AT VARYING PRICES AND YIELDS

\$ per Pound	YIELD (Pounds/acre)						
	3000	4000	5000	6000	7000	8000	9000
.30	-120	85	290	495	700	905	1,110
.35	30	285	540	795	1,050	1,305	1,560
.40	180	485	790	1,095	1,400	1,705	2,010
.45	330	685	1,040	1,395	1,750	2,105	2,460
.50	480	885	1,290	1,695	2,100	2,505	2,910
.55	630	1,085	1,540	1,995	2,450	2,905	3,360
.60	780	1,285	1,790	2,295	2,800	3,305	3,810

INCOME ABOVE ALL COSTS AT VARYING PRICES AND YIELDS

\$ per Pound	YIELD (Pounds/acre)						
	3000	4000	5000	6000	7000	8000	9000
.30	-1,589	-1,384	-1,179	-974	-769	-564	-359
.35	-1,439	-1,184	-929	-674	-419	-164	91
.40	-1,289	-984	-679	-374	-69	236	541
.45	-1,139	-784	-429	-74	281	636	991
.50	-989	-584	-179	226	631	1,036	1,441
.55	-839	-384	71	526	981	1,436	1,891
.60	-689	-184	321	826	1,331	1,836	2,341