1988 SAMPLE COST TO PRODUCE FLOOD-IRRIGATED (MOWED) PRUNES IN THE SACRAMENTO VALLEY

by

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UC Cooperative Extension

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This cost study provides detailed information on the sample cost of producing flood-irrigated (mowed) prunes in the Sacramento Valley. Costs are projected for a hypothetical 100 acre orchard on 105 acres of land. The 5 non-producing acres are for buildings, roads, ditches, burn area, etc.

This study is part of a series of cost study worksheets which describe the sample cost to establish drip-irrigated prunes, the cost of producing drip-irrigated prunes, the cost of producing sprinkler-irrigated prunes, and the cost of producing flood-irrigated (mowed) and flood-irrigated (cultivated) prunes. Each study in the series shares a common list of assumptions, but each production study has a separate Cost of Production Worksheet, Monthly Summary of Sample Costs, Equipment List, and Ranging Analysis. 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 Sacramento 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 prunes 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 on the Cost of Production Worksheets to enter your actual costs.

For explanation of calculations used for the study refer to the attached List of Assumptions, call Agricultural Economics Extension, University of California, Davis, California (916) 752-2745, or contact the Farm Advisor in your county.

ESTABLISHMENT AND PRODUCTION COST ASSUMPTIONS FOR GROWING PRUNES

IN THE SACRAMENTO VALLEY - 1988

The following list contains a description of some general assumptions pertaining to the sample costs of establishing and producing prunes in the Sacramento Valley. The establishment assumptions apply to current sample costs for establishing a new orchard. The production assumptions apply to typical sample costs for a well managed, 12 year old prune orchard in full production.

A. ESTABLISHMENT ASSUMPTIONS ONLY

1. Land and trees for establishing a new orchard in 1988:
   Bare land value (105 acres): $2,500/acre
   Trees - 155 Trees/acre - 18' X 18' equilateral triangle.

2. Drip irrigation system.

3. Orchard floor management includes herbicide strip spray with mowed centers.

B. ESTABLISHMENT AND PRODUCTION ASSUMPTIONS

1. Land and trees for 12 year old orchard:
   Bare land value (105 acres): $1,335/acre
   Establishment costs - 108 Trees/acre - 20' X 20' Spacing. $4,000/acre

   Since only 100 of the 105 total acres are in production, the land value per acre needs to be adjusted to $1400 per producing acre. Investment costs for land and trees reflect actual cost incurred at time of planting. The annual costs for depreciation are obtained by dividing the initial establishment costs by 20 years. Land is not depreciated. Interest on the investment in land and trees is calculated by multiplying the interest rate (11%) by the average value of land and trees. The average value of the trees is estimated to be one-half of the establishment costs.

2. Labor rates: (include 27% for SDI ,FICA, insurance, and other benefits)
   Skilled labor (machinery operators): $7.25/hr
   Field labor (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. Fuel and repair costs:
The cost of production worksheets contain numbers in two columns with the headings Tractor/Implement No. and Implement No. which refer to the item number on the equipment table. The far right- hand column on the equipment table shows the fuel and repair costs per hour which is multiplied by the hours used per acre for each piece of equipmenmt to obtain the cost per acre for fuel and repairs.

5. Office and business costs include phone, office supplies, accouting fees, etc.

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

7. Equipment insurance is at 0.8% of the average value of equipment.

8. Pickup costs are based on 10,000 miles/year of farm operation at $0.15/mile.

9. Supervisory fees are not included in the cost study, but are estimated to be between $30 - $100/acre.

10. Safe chemical storage is included with the shop building.

11. Irrigation assumptions:
Surface water is assumed as the water source for all systems. If water is pumped from a well then material costs for irrigation (pumping costs) and the ownership costs of a well and pump should be included.

a. Flood irrigated/mowed and Flood irrigated cultivated:
Flood system, six irrigations, 36.00 acre inches/year total. Gravity flow. Water costs = $10.00/acre-foot.

b. Sprinkler irrigated: Solid set sprinklers, six irrigations - 24 hour/10 acre sets - 36.00 acre inches/year total. 50 HP Pump. Capacity: 900 gal/min - 2 acre inches/hour. Electricity costs @ 50% plant efficiency (booster pump) = $25.00/acre-foot.

c. Drip irrigated: Drip system, daily irrigations, 36.00 acre inches/year total, 25 HP Pump., Capacity: 900 gal/min - 2 acre inches/hour. Electricity costs @ 50% plant efficiency = $17.00/acre-foot.

12. Harvest costs are based on custom harvest and custom dehydration.

13. Interest on operating capital is based on cultural costs and assumes a 9 month loan at 11%.

14. Orchard floor management:
    a. Flood Irrigated/Mowed and Sprinkler Irrigated: Herbicide strip spray applied in fall, centers mowed for weed control five times, brush chopped in spring, spot treatment with post-emergence herbicide in spring.

    b. Flood Irrigated/Cultivated: Cross cultivation for weed control three times, cross cultivation for brush disposal in spring.

    c. Drip Irrigated: Herbicide strip spray applied in fall, spot treatment with post-emergence herbicide in spring and summer, centers mowed for weed control three times, brush chopped in spring.

15. Insect and disease control:
Dormant spray with organophosphate insecticide and oil for control of twig borer, aphids, scale, and mite eggs. Full bloom spray with fungicide for control of brown rot and russet scab.

16. Potassium sulfate (K_2SO_4) is applied at a maintenance level, not at a level high enough to correct a deficiency.

SAMPLE COSTS TO PRODUCE PRUNES - FLOOD IRRIGATED/MOWED
Sacramento Valley - 1988

Labor Rate: $7.25/hr. skilled labor
$5.40/hr. field labor

Interest Rate: 11%
Yield fresh(tns/acre): 11.0

Operation	Tractor/ Implement No.	Implement No.	Hours	Labor Cost/A	Fuel & Repairs	Material Cost	Custom /Rent	Total Cost	Your Cost
				--- Cash and Labor Costs per Acre ---					
Cultural costs:									
Pruning - 108 trees/acre				$135.00				$135	
Brush Chopping	1	5	1.1	13.92	$8.92			23	
Fertilize (100# N @ $.19)						$19.00	$2.75	22	
Fertilize (500 lbs K2SO4)						60.00	2.75	63	
Dormant spray	1	4	.5	3.99	5.11	13.00		22	
Disease spray	1	4	.5	3.99	5.11	20.51		30	
Mow (6X)	1	5	1.8	13.96	14.20			28	
Herbicide (Fall & Spring)	2	3	1.0	7.98	5.10	27.00		40	
Irrigation (6 X 6")	10				8.00	30.00		38	
Labor			1.0	5.40				5	
Bees - 1 Hive/acre @ $5							5.00	5	
Costs for pick up truck					15.00			15	
Interest on operating capital @ 11%								35	
TOTAL CULTURAL COSTS			6	$184	$61	$170	$11	$461	
Harvest Costs:									
Harvest Costs	$20 per ton						$220	$220	
Haul	$7 per ton						77	77	
Dehydrate (Incl. bin rent)	$65 per ton						715	715	
TOTAL HARVEST COSTS							$1,012	$1,012	
Cash overhead:									
Office and business costs								$60	
County Taxes								39	
Equipment Insurance								4	
TOTAL CASH OVERHEAD COSTS								$103	
TOTAL CASH COSTS								$1,575	
TOTAL CASH COST/DRY TON:	11 fresh tons/ac. @		3.2 dry away					$458	

Investment	Per production Acre	--- Annual Cost --- Depreciation	Interest @ 11%	
Land @ $1,335/acre (bare)	$1,400		$154	$154
Equipment & buildings	977	$83	54	137
Trees (20 yr. depreciation)	4,000	200	220	420
TOTAL INVESTMENT COSTS	$6,377	$283	$428	$711
TOTAL COSTS PER ACRE				$2,286
TOTAL COST/DRY TON:	11 fresh tons/ac. @	3.2 dry away		$665

MONTHLY SUMMARY OF
SAMPLE COSTS TO PRODUCE PRUNES - FLOOD IRRIGATED/MOWED

Sacramento Valley - 1988

Operation	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	TOTAL
Cultural costs:													
Pruning - 108 trees/A	67.5											67.5	$135
Brush Removal	11.4	11.4											23
Fertilize (100# N)							21.8						22
Fertilize 500# K2SO4											62.8		63
Dormant spray		22.1											22
Disease spray			29.6										30
Mow (6X)				4.7	4.7	4.7	4.7	4.7		4.7			28
Herbicide 2X				20.0						20.0			40
Irrigation (6 X 6")				6.3	6.3	6.3	6.3	6.3	6.3				38
Labor				.9	.9	.9	.9	.9	.9				5
Bees - 1 Hive/acre			5.0										5
Pick-up truck costs	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	15
Int.operating capital	.7	1.1	1.4	1.7	1.9	2.0	2.3	11.7	11.9				35
TOTAL CULTURAL COSTS	$81	$36	$37	$35	$15	$15	$37	$25	$20	$26	$64	$69	$461
Hazvest Costs:													
Harvest Costs								220.0					220
Haul								77.0					77
Dehydrate								715.0					715
TOTAL HARVEST COSTS								$1,012					$1,012
Cash overhead:													
Office and business	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	60
County Taxes				19.4								19.4	39
Equipment Insurance	3.9												4
TOTAL CASH OVERHEAD	$9	$5	$5	$24	$5	$5	$5	$5	$5	$5	$5	$24	$103
TOTAL CASH COSTS	$90	$41	$42	$59	$20	$20	$42	$1,042	$25	$31	$69	$93	$1,575

EQUIPMENT AND BUILDING LIST FOR PRUNES - FLOOD IRRIGATED/MOWED
Sacramento Valley - 1988

Interest Rate: 11% Fuel Cost per Gallon $.65 diesel
$.75 unleaded

ITEM #	DESCRIPTION	NEW COST	ANNUAL USE (ACRES)	COST PER ACRE	LIFE (HRS)	YEARS TO TRADE	OVERHEAD* DEPREC-IATION	OVERHEAD* INTEREST*	TAR*	HOURLY COSTS FUEL*	HOURLY COSTS REPAIRS*	HOURLY COSTS TOTAL
	Tractors:											
1	60 HP wheel diesel	$22,000	100	$220	12,000	10	22	$12.10	120%	3	2	$4.81
2	30 HP wheel diesel	15,000	100	150	12,000	10	15.00	8.25	120	1.31	1.50	2.81
3	Weed sprayer, P.T.O.	2,750	100	28	1,200	10	2.75	1.51	100		2.29	2.29
4	PTO sprayer, 500 gal.	13,500	100	135	2,000	10	13.50	7.43	80		5.40	5.40
5	Rotary mower, 10 foot	5,500	100	55	2,000	10	5.50	3.03	120		3.30	3.30
6	Mounted forklift attach.	4,500	100	45	3,000	10	4.50	2.48	60		.90	.90
7	Ladders & Pruning equip.	1,200	100	12		10	1.20	.66	100			
8	Truck, 1 1/2 ton	17,500	100	175	2,000	8	21.88	9.63	80			
9	Pick-up, 1/2 ton	14,000	100	140	2,000	5	28.00	7.70	60			
10	Flood irrigation system	32,500	100	325	27,000	40	8.13	17.88	36		.43	.43
11	Offset disc, 9' 9"	5,336	100	53	2,500	10	5.34	2.93	120		2.56	2.56
	Buildings	25,000	100	250		35	7.14	13.75				
	Miscellaneous shop tools	4,000	100	40		10	4.00	2.20				
	TOTAL COST	$162,786		$1,628			$139	$90				
	60% OF NEW COSTS*	$97,672		$977			$83	$54				

* 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 the machine's life expressed as a 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.

PER ACRE COST TO PRODUCE FLOOD IRRIGATED/MOWED PRUNES AT VARYING PRICES AND YIELDS

	YIELD (Dry Tons/acre)						
	1	2	3	4	5	6	7
Cultural Costs	461	461	461	461	461	461	461
Harvest Costs	294	589	883	1,178	1,472	1,766	2,061
Cash Overhead	103	103	103	103	103	103	103
Cash cost/acre	858	1,152	1,447	1,741	2,035	2,330	2,624
Cash cost/ton	858	576	482	435	407	388	375
Investment cost	711	711	711	711	711	711	711
TOTAL COST/ACRE	1,569	1,863	2,158	2,452	2,746	3,041	3,335
TOTAL COST/TON	1,569	932	719	613	549	507	476

PER ACRE INCOME ABOVE CASH COSTS AT VARYING PRICES AND YIELDS

	YIELD (Dry Tons/acre)						
$ per Dry Ton	1	2	3	4	5	6	7
600	-258	48	353	659	965	1,270	1,576
700	-158	248	653	1,059	1,465	1,870	2,276
800	-58	448	953	1,459	1,965	2,470	2,976
900	42	648	1,253	1,859	2,465	3,070	3,676
1,000	142	848	1,553	2,259	2,965	3,670	4,376
1,100	242	1,048	1,853	2,659	3,465	4,270	5,076
1,200	342	1,248	2,153	3,059	3,965	4,870	5,776

PER ACRE INCOME ABOVE TOTAL COSTS AT VARYING PRICES AND YIELDS

	YIELD (Dry Tons/acre)						
$ per Dry Ton	1	2	3	4	5	6	7
600	-969	-663	-358	-52	254	559	865
700	-869	-463	-58	348	754	1,159	1,565
800	-769	-263	242	748	1,254	1,759	2,265
900	-669	-63	542	1,148	1,754	2,359	2,965
1,000	-569	137	842	1,548	2,254	2,959	3,665
1,100	-469	337	1,142	1,948	2,754	3,559	4,365
1,200	-369	537	1,442	2,348	3,254	4,159	5,065