

PRODUCING EUCALYPTUS FOR FIREWOOD OR BIOMASS
SACRAMENTO VALLEY AND FOOTHILLS REGION | 1987

Establishment and Production Costs

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Although Eucalyptus has been grown in California for many years, the production of Eucalyptus for energy is a new industry which has recently received much attention.

Potentially eucalyptus has many markets, including firewood, pulpwood for paper and chips to fire biomass generators. The economics of these uses are currently limited by transportation costs to facilities.

Because of the newness of the industry, much of what is presented here are estimates of what would be the best management practices gathered from people involved in the industry. These may or may not be born out by experience, but can be used as a starting point for comparing this venture with other possible land uses. You can adjust the costs where you think yours will differ from the ones we have used. We have tried to present estimates of costs, yields and returns as realistically as possible. This is not intended to imply that these costs and management priorities are optimum inputs. This information will have to come from local observations and assessments of the yield response from different cultural inputs.

Returns are based on what can be earned today. We have no way of knowing what prices will be in five or six years when the trees are harvested. It is likely that energy prices will increase.

The study is based on a small acreage (5 acres) because most of the requests we have received for information have come from people interested in small acreages. For this reason land preparation, which would require expensive equipment, was figured at custom rates.

One of the largest costs in this study is the opportunity cost of the land. This represents an estimate of what could be earned with the money invested in the land if it was invested in another enterprise. The cost we have used for land is fairly low (\$2,500 per acre). This is because we are thinking of "marginal" land or land which may not be adaptable to much else. Eucalyptus are quite adaptable and may do well where other crops would not. Examples might include areas with high water tables, alkaline soils, or foothill soils.

The irrigation system used in this study is furrow irrigation. In a foothill situation a drip system might be used instead. In the foothills the grower will also have to consider deer, rodent, and grasshopper control. None of these costs are included in this study, however.

For biomass production the wood is generally sold on the stump and chipped under contract. Therefore, no harvest costs are included for biomass production.

ASSUMPTIONS:

1. Land - \$2,500 per acre. A 20 year mortgage at 10% interest
2. Spacing - 6x6 foot square spacing resulting in 1210 trees per acre
3. Labor - \$6.50 per hour
4. Nitrogen application

2nd year - 75 lb/acre	75
3rd year - 100 lb acre	100
4th year - 150 lb/acre	150

5. Irrigation - furrow irrigation at a cost of \$200 per acre.
20 year life. 6 hours of labor per year

1st year - 2 acre ft
2nd year - life of stand - 3 acre ft

6. Interest on cultural costs -

Interest is charged on the establishment and production years on the accumulated cultural costs at 10% per year. These figures are estimates of the opportunity cost of keeping cash tied up in the stand. They also may be considered interest on borrowed capital.

The interest on cultural costs in Table 2, Costs of Producing Eucalyptus, is charged on the accumulated cultural costs over the five year rotation. Cultural costs are the sum of irrigation, fertilizer and miscellaneous labor for a total of \$134 per year for five years.

Year	1	2	3	4	5
Cultural Cost	\$134	\$134	\$134	\$134	\$134
Accumulated Cultural Cost	134	268	402	536	670
Interest at 10%	13	27	40	54	67

Total interest per rotation = \$201

COMMENTS;

1. On the production cost study, the costs are per rotation. That is, for a five year production period. So the depreciation and interest figures are for five years.
2. The first year is considered the establishment year. In the sixth year there is a cutting and this is treated as the end of the first rotation. The total establishment cost is divided equally among the four rotations and appears in the cost study as depreciation on trees.
3. The interest payment on the land mortgage is \$843 per rotation. Without any land payments the cost per cord on a 36 cord yield is \$92 per cord when harvest costs are included. At a 36 cord yield, the cost is \$57 per cord without any land charge or harvest costs.

Table 1. SAMPLE COSTS TO ESTABLISH EUCALYPTUS
Sacramento Valley 1987

1,210 trees per acre

OPERATION

Disc & smooth (custom)	\$50
Pre-emergence herbicide (1st and 2nd year)	
application	14
material	40
Spot herbicide (1st and 2nd year)	
application	2
material	40
Layout (3.2 hrs/acre)	21
Planting (12 hrs/acre)	
labor	78
trees	847
Fertilizer	
application	3
nitrogen	26
Irrigation	
labor (6 hours/acre)	39
district water (\$8/AF)	16
Misc. labor	15
TOTAL CULTURAL COSTS	\$1,191
OVERHEAD COSTS (office,taxes,insurance,misc.)	\$50
TOTAL CASH COSTS	\$1,241
Interest on investment @ 10.00%	
cultural costs	119
equipment & irrigation*	16
land - \$2,500 per acre	250
TOTAL INTEREST	\$385
TOTAL DEPRECIATION*	\$24
TOTAL ANNUAL COSTS	\$1,650

*refer to Table 3. Equipment List

Table 5a. COSTS TO PRODUCE EUCALYPTUS FOR BIOMASS*

DRY TONS PER ROTATION	40	72	84	120
Cultural costs	\$669	\$669	\$669	\$669
Overhead cost	451	451	451	451
TOTAL CASH COST	\$1,120	\$1,120	\$1,120	\$1,120
Land	843	843	843	843
Trees	826	826	826	826
Equipment	199	199	199	199
TOTAL INVESTMENT COST	\$1,868	\$1,868	\$1,868	\$1,868
TOTAL COST/ROTATION	\$2,988	\$2,988	\$2,988	\$2,988
TOTAL COST PER CORD	\$75	\$42	\$36	\$25

* See Table 2. Sample Costs to Produce Eucalyptus for cost breakdowns.

Table 5b. INCOME PER ROTATION ABOVE CASH COSTS

\$ / DRY TON	DRY TONS PER ROTATION			
	40	72	84	120
\$10	\$-720	\$-400	\$-280	\$80
12	-640	-256	-112	320
14	-560	-112	56	560
16	-480	32	224	800
18	-400	176	392	1,040
20	-320	320	560	1,280

Table 5c. INCOME PER ROTATION ABOVE TOTAL COSTS

\$ / DRY TON	DRY TONS PER ROTATION			
	40	72	84	120
\$10	\$-2,588	\$-2,268	\$-2,148	\$-1,788
12	-2,508	-2,124	-1,980	-1,548
14	-2,428	-1,980	-1,812	-1,308
16	-2,348	-1,836	-1,644	-1,068
18	-2,268	-1,692	-1,476	-828
20	-2,188	-1,548	-1,308	-588