

TECHNICAL NOTES

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SOIL CONSERVATION SERVICE

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The Economics of Eucalyptus Tree Planting for Commercial Sale of Fuelwood Produced on Land Eligible for Enrollment in the USDA Conservation Reserve Program

Introduction: The following information is intended to serve as a guide to individuals interested in participating in the Conservation Reserve Program (CRP). The planting of trees is analyzed as an alternative to simply taking land out of production, controlling weeds as required by CRP contracts and receiving a uniform payment for the 10 year contract period. Projections are made to compare expected net income from participation in the program with and without planting eucalyptus trees.

The analysis provided is based on actual data, grower interviews, professional experience and research conducted by individuals working in California with the USDA Forest Service, the Soil Conservation Service and the University of California Cooperative Extension Service. The results are generally applicable to any California area where the lowest annual temperature is above 20 degrees Fahrenheit. Much of the central valley, coast and inland southern deserts are considered as having appropriate climatic conditions for eucalyptus tree production.

Background: For the purposes of this brief report, 40 acres of CRP eligible cropland are evaluated for planting eucalyptus trees (River Red Gum, "Eucalyptus camaldulensis" for the central valley and inland southern desert areas and Blue Gum, "Eucalyptus globulus" for the coast) for erosion control and firewood production. The presumed site has a sandy soil, was previously cropped (predominantly cotton and alfalfa) and has a salinity problem which restricts crop growth. The field is presumed to have been leveled in the past to allow for more efficient furrow irrigation.

Tree Culture in California: The optimal planting period is from April to early June. Recommended stocking for fuelwood and biomass production is 1200 trees/acre (6' x 6' or 5' x 7'). Actually, 37.25 acres are planted at this spacing when allowing for 3 unplanted strips with a recommended minimum 30' width. The unplanted strips serve as fire breaks and management access areas. Weeds within the unplanted strip areas and stands should be controlled during the first two years of growth until canopy closure occurs. Weed control in the unplanted strip areas can be achieved during the growing season by withholding irrigation water, by disking or by other methods.

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It is recommended that the strips be placed in a parallel position with one strip on each end of the field and the third in the center of the stand. The strips will provide some protection against fire, disease and insects by physically separating the field into two isolated units. Additionally, the strips will facilitate access for management operations such as weed control, pruning and harvesting. They can also be used to stack cut fuelwood for air-drying before shipping.

The site chosen is presumed to have a medium site index value of 85 as defined by the UC/Extension Service Eucalyptus Growth and Yield Model. A site index of 85 predicts that the tallest 10% of the trees in the stand will measure 85 feet tall and the stand will yield between 50 to 100 cords (85-90 cubic feet) of solid firewood/acre at 10 years of age. Yield variation is dependent upon the quality of subsurface water and whether or not supplemental water and fertilizer applications are made after year one.

A preirrigation before planting is necessary. Gypsum should be applied to the site before the preirrigation. These two cultural practices will work together to improve soil structure and help drive salts lower in the soil profile which is important during the initial period of seedling establishment. The preirrigation also of course provides water for the young seedlings to be planted. If a preirrigation is not done, then seedling mortality can be expected to exceed the 7% rate used in this analysis. A 20% total mortality rate would necessitate significant replanting efforts.

Economic Assumptions: Your individual situation will vary from the production, price and cost relationships assumed in this analysis, but the example should serve as a general guide which you can customize to meet your particular needs. In essence, the analysis provided is based upon a conservative projection of current production and market conditions into the future.

An economic feasibility analysis is first provided with all costs and returns being estimated then placed on a common time basis by discounting with a single interest rate, 12 percent. Twelve percent is also used for the cost of capital and amortization estimates for net average annual returns. A single page cashflow/financial analysis is also presented which uses two interest rates to reflect the difference between the cost of capital (12%) and a presumed earnings capability of capital (6 percent) when cashflow is positive.

The assumed yield is 60 cords/acre at the end of ten years. Irrigation water is only provided during the first year. Thereafter, tree roots are expected to reach the shallow perched water table common to many areas in the state. Supplemental water is not needed except to achieve higher yields.

Stand life is planned to be 26 years to accommodate the 10 year CRP contract period and eight additional years each for a second and third cutting in years 18 and 26. The eight year periods between the first and the second cutting and the second and the third cutting reflect the expected amount of time needed to produce volumes equal to the first cutting from coppiced (sprouted) regrowth. Experience in other parts of the world indicates that economical production from coppiced regrowth of eucalyptus trees can be maintained for 10 cuttings or more.

Thinnings of the regrowth sprouts will be required in years 11 and 19. Leave only three stems per stump. Trunk diameter at breast height (DBH) is expected to range from 4"-12" with an average DBH of 5.5 inches. Therefore, splitting of the cut fuelwood at harvest will not be necessary in general.

For the economic analysis, investment capital is borrowed during stand establishment in year one. The reader will note that loan principal repayments are delineated in the example write-up, but are not included as part of the economic analysis. Only interest payments are included because debits for payment of principal would result in double counting, i.e., they are already part of the costs of installation. The owner is presumed to contribute \$3000, 20 percent of the initial investment capital required, and to make-up principal and interest not covered by payments from the ASCS with monies from other enterprises or sources of income. Investment capital principal is assumed to be fully repaid by the end of year two.

Operating capital is assumed to be borrowed during the second year of stand establishment and during harvest year operations only. Repayment of operating capital borrowed during harvest is assumed to be completed five months after the first trees are cut. This assumes that operations become self-financing after the first cut trees are dry and ready to be sold.

Harvest costs presume that the owner/operator hires laborers and manages harvest and marketing operations with his/her own equipment, trucks and/or trailers, chainsaws, etc. Direct retail marketing is employed. The assumed costs of marketing include costs for weekly newspaper advertisement. Future year input costs and product prices are not inflated, i.e., real and nominal (inflationary)

changes in future costs/prices are not predicted. The net present value analysis employed assumes that future costs and prices are to maintain the same relationship relative to each other. In other words, they will go up, but at roughly the same rate, therefore predictions are deemed unnecessary.

The analysis provided for the second and third cuttings includes only the added operating costs and returns given that the initial investment and working capital costs are recaptured during the first 11 years. Recurrent (operation, maintenance and replacement) costs after the stand is established are expected to be minimal except for the second year of each cutting cycle when hand labor is required for pruning of excessive regrowth sprouts.

No consideration of federal and state income tax provisions is made. Thus reported profits represent net income before taxes based on projected market receipts and an assumed CRP contract payment price of \$48/acre/year. Cost/share dollars from the ASCS are also included for 50 percent of the establishment costs during the first year of the investment (Actual cost/share rates in your county may vary above or below the 50% used in this report).

The economic and cashflow analyses are separate methodologies with comparable but distinct outcomes and therefore should not be directly compared. They do not show the same exact dollar figure results, but do lead to the same conclusions. The economic analysis indicates whether or not returns exceed costs. The separate cashflow budget is provided (page nine of the attached analysis) to give some indication of the financial feasibility and cashflow implications of this investment. The cashflow/financial analysis should help a grower to decide if their financial condition could support the expense requirements during the initial years of negative cashflow and to make the case before creditors for gaining any needed investment capital.

Finally, a charge for land is not included. It is presumed that only growers with already owned land or nearly owned land would seriously consider a productive use which covers their land rent or mortgage payment and costs to control noxious weeds. The \$48/acre/year from the regular CRP program would not cover the cost of most unowned land.

Costs to remove stumps from the field after the 26 year rotation were not included based on the rationale that continued production would most likely be reviewed in light of the stands vigor, market conditions and the owners objectives at that time. Stump removal to return the field to other productive uses would only require the use of a 3 pronged ripper behind a DB tractor or similar, followed by a DB or similar tractor with an 8' brush rake on the front of

it. The debris could be salvaged for biomass uses or piled by a tractor with a brush rake and burned.

Risk and Uncertainty: An attempt to make quantified estimates of the risk and uncertainty associated with the basic assumptions contained in this study has not been made. However, it is self evident that the longer the period of time between an initial investment and its' recapture, plus attainment of a profit, the more risk and uncertainty one is exposed to. The initial ASCS cost/share reimbursement and annual CRP rental payments can be viewed as a significant hedge against future risks.

The main risk exposure associated with planting eucalyptus trees is presumably the threat of fire. However, depending on the age of the stand and severity of the fire, salvage value for the remaining fire damaged stumpage could yield some economic returns. If not, then net profits would be reduced significantly, but the annual CRP payments would still assure some profit over the ten year period.

The other significant uncertainty with such a long term investment is with respect to future market conditions. No one can accurately predict market prices and costs on a consistent basis one year in advance, let alone 11 or 26 years in advance. However, the results of this analysis indicate that tree planting for firewood production in a state with a growing population and increasing demand for firewood is an attractive investment opportunity with or without annual CRP contract payments and ASCS cost-share assistance. The initial years of negative cashflow represent the single greatest hindrance to potential investors.

Results: The economic analysis indicates that tree planting with ASCS cost-share assistance plus annual CRP contract payments of \$48/acre results in an average annual profit (discounted into present value terms then amortized over the life of the investment) before taxes of approximately \$12,813 or \$320/acre/year for 26 years. The total present value of before tax profits is estimated to be \$62,788 (\$1,570/acre) at the end of the 10 year CRP contract period and after harvest and fuelwood sales are completed in year eleven. This equals a 176 percent rate of return on investment (RRI) as calculated by subtracting discounted costs from discounted returns and dividing by the discounted costs (initial investment and operating capital).

The present value of before tax profits increases by \$38,379 to \$101,167 or \$2,529/acre when including returns from a second and third cutting of the regrowth from coppice management of the stand. This represents an impressive 284 percent RRI.

Net profit with ASCS cost/share dollars and annual CRP payments compares extremely favorably with the projected average annual profit of \$39/acre from participation in the regular CRP program. Alternatively expressed, the estimated net present value of unreinvested profit before taxes from 10 year participation in the regular CRP program is \$8,780 (\$220/acre) for a phenomenal 425 percent RRI. If reinvested at six percent interest and compounded annually, the net present value of CRP returns above costs would approximate \$11,438 or \$286/acre (RRI of 553%).

The financial analysis indicates that under the presumed set of assumptions, a negative cashflow occurs for the first five years. All debt is extinguished by year six through annual CRP payments and the initial ASCS cost share for establishment of the trees. The value of accumulated profits at the end of year eleven is estimated to be \$239,695 or \$5,993/acre.

Interestingly, the present value of net returns after year eleven (\$239,695) at 12 percent interest is \$68,908 which approximately equals \$1,700/acre. The \$1,700/acre represents the capitalized value of the land which should be mirrored by the market value of the land. However, the \$1,700/acre is a value far above the current agricultural real estate market value for comparable land (\$400-\$800 per acre). The difference between the two is attributable to the subsidy effect of the CRP program. In the absence of a perched water table and salinity problem, such land would likely have a market value comparable to the \$1,700/acre figure.

Summary and Conclusions: The analysis indicates that investment in eucalyptus trees on land eligible for enrollment in the Conservation Reserve Program is an extremely attractive investment if one's current financial position could allow for the initial years of negative cashflow. The principal exposure to risk is believed to be associated with the potential for stand destruction or damage by fire, which can be minimized if fire breaks are maintained. The salinity and perched water table tolerance nature of eucalyptus trees coupled with enrollment in the CRP program offers land owners an attractive opportunity to make productive use of the resource base and contribute to soil conservation.

A summary table follows to facilitate comparison of the results with and without tree planting, including ASCS cost/share and annual CRP payments.

Economic Analysis Results Summary
(With Cost/Sharing and CRP Payments)

	<u>With Trees</u>	<u>Without Trees</u>
I. Undiscounted Profit (before taxes):		
-At the end of yr 11 w/trees, yr 10 without:	\$222,729 (\$5,568/ac)	\$15,540 (\$389/acre)
-Accumulated by the end of yr 26:	\$648,000 (\$16,200/ac)	NA
II. Present Value of Profit (12% discount):		
-11 years hence with trees, 10 yrs without:	\$62,788 (\$1,570/ac)	\$8,780 (\$220/acre)
-Accumulated 26 years hence:	\$101,167 (\$2,529/ac)	NA
III. Average Annual Equivalents of II. Above (12% discount):		
-For 11 years with trees, 10 yrs. without:	\$10,575 (\$264/acre)	\$1,554 (\$39/acre)
-For 26 yr investment:	\$12,813 (\$320/acre)	NA
IV. Rate of Return on Investment (before taxes):		
-For 11 years with trees, 10 yrs. without:	176%	425%
-For 26 yr investment:	284%	NA



USDA SOIL CONSERVATION SERVICE
Practice Cost/Expected Net Income Sheet
September 8, 1988

Practice: Eucalyptus Tree Planting on Conservation Reserve Program Land
 Sub-System: Soil Management and Erosion Control
 Expected Life: 11 years minimum, 26 years planned
 Selected Job: Plant 40 acres of CRP eligible cropland to trees (River Red Gum, "Eucalyptus camaldulensis" for the central valley & southern California and Blue Gum, "Eucalyptus globulus" for the Coast) for erosion control & firewood production. The 40 acre site is presumed to have been leveled in the past to allow for efficient furrow irrigation. Optimal planting period is from April to early June. Recommended stocking is 1200 trees/acre (6'x 6' or 5'x 7') with 37.25 acres actually planted when allowing for 3 parallel unplanted strips, 30' wide which will serve as fire breaks and management access areas. The site chosen has a medium site index value of 85. The assumed yield used for calculations below is 60 cords/acre harvested at the end of the tenth year with irrigation water being applied during the first year only. Stand life is planned to be 26 years with a second and third cutting of equal yields expected from coppiced regrowth occurring in years 18 and 26. Thinnings of the regrowth sprouts will be carried out in years 11 and 19 to leave only three stems per stump. Trunk diameter at breast height (DBH) is expected to range from 4"-12" with an average DBH of 5.5 inches.

PRODUCTION COSTS:

Installation:	Typical Cost	Your Cost
Site Preparation in mid to late March: Disk 3 times w/16'tandem disk & a 75Hp tractor; /acre tractor, implement, fuel, labor & maint. costs are: \$1.45; \$1.40; \$0.60; \$0.60; and \$1.50=\$5.55 * 40 acres:	222	-----
After 2nd disking custom apply 3 tons of gypsum/acre @ \$17.00/acre + 37.25acres:	633	-----
Float once with spike-tooth harrow or a ring-roller & a 60Hp tractor; /acre \$ costs for tractor; implement, fuel, labor and maint. are: \$1.25; \$.75; \$0.40 and \$1.15= \$3.55 + 40 acres:	142	-----
Pull irrigation furrows w/shovels set on 72" centers and apply Treflan or other herbicide to control grasses; use 60Hp tractor; /acre costs for tractor, implement, spray equip., fuel, labor & maint. are: \$1.25; \$0.50; \$1.60; \$0.20; \$0.50 \$1.45 & \$35/gal for Treflan(use 1.6pts/acre @ \$3.5/ac= \$9.00/acre*37.25 acres:	335	-----
Pre-Irrigation in early April before planting: apply 4" of water @ \$30/AcFt + 37.25 acres:	369	-----
Irrigation labor cost of 1/2hr/ac at \$5.50/hr +37.25acres:	102	-----

Planting:

Use 60Hp tractor w wheels in irrigation furrows, plant 1200 trees/acre on center w a tree or veg. seedling planter; /acre cost for tractor, planter, fuel, labor, maint. & seedlings are: \$1.25; \$5.00; \$0.50; \$17.60(crew of 4 @ \$5.50/hr*1.25 acres/hr); \$1.30 and \$0.15/seedling(1200* \$0.15=\$180.00 total)=205.65/acre*37.25:	7660	-----
Irrigation during first year: at planting apply 4" of water; during remainder of first year apply 5 more irrigations of 4" each once a month for a 2AcFt total at \$30/Acre Foot * 37.25acres:	2235	-----
Irrigation labor cost of 1/2hr/ac at \$5.50/hr *37.25acres:	615	-----
Fertilization (optional): Fertilize at 2 months with 100cwt/acre of UN32 (32lbs.of N/ac) @ \$160/ton or \$0.08/lb. * 37.25 acres:	298	-----
Sidedress application w a 60HP tractor and colters to cover; /acre costs for tractor, implement, fuel, labor repairs and maintenance are: \$1.25; \$0.50; \$0.40; \$0.50 and \$1.45 *37.25 acres:	153	-----
Re-planting in July due to 7% mortality: Survivability is highly dependent on timeliness of irrigations and the prevalence of "hot-spots"; w pre-irrigation & a medium site, mortality is not expected to exceed 7%; therefore 84 seedlings/acre * 37.25acres must be replanted w same assumed equip. & operations as above, but assumed planting rate of 5ac/hr:	933	-----
Post Planting Weed Control: Carefully apply Roundup or other herbicide to control weeds during 1st and 2nd growing seasons until canopy begins to close: 1pt/ac @\$68/gal=\$4.25 per pint *37.25 acres plus costs for 60Hp tractor, spray tank, fuel, labor, repair & maintenance @ \$1.25; \$1.60; \$0.20; \$0.50 and \$1.35 respectively * 37.25 acres (\$182.52)+(\$158.31):	1st Sea. 341	-----
2nd application @ \$340.84 in yr two:	341	-----
Thinning during year 2: 10 person crew for five 8hr days @ \$5.50/hr:	2200	-----
Annual misc. expense of \$20/yr, yrs 3-10:	160	-----
Sub-Total:	16739	-----
Per Ac Cost:	418	-----

vestment Capital Principal and Interest:
Based on 12%, \$11000 borrowed with \$9000 repaid
when ASCS reimbursement occurs and 1st CRP pay-
ment is received and \$2000 repaid in year two
when 2nd annual CRP payment is received:

Yr 1 principal payment: \$9943	n/a	-----
Yr 1: 12% interest on sub-total less yr. 2-5 expenditures [\$16650.06-($\$340.84 +$ $\$2200 + \160.00)] = \$14038.50 - 20% owner equity in the investment or \$3038.50 = \$11000:	1320	-----
Yr 2: principal payment: \$1057	n/a	-----
Yr 2: 12% on the unpaid balance:	127	-----
Sub-Total:	1447	-----
Per Ac Cost:	36	-----

Operating Capital Interest for Year 2:

Yr 2 expenditures, \$2540.84 * .12/12*10, the periodic rate factor for 10mo@12 percent:	254	-----
Grand Total of Production Costs:	18440	-----
Per Ac Cost:	461	-----

Harvest Costs/First Cutting:

Year 11 harvest costs will include a crew
of harvestors, assumed to consist of 3
cutters w chainsaws & 3 stackers to cut,
buck, move to unplanted strips and stack
the wood for air drying. Crew members
will probably alternate tasks with one
driving a tractor w a flatbed trailer to
transport, assist unloading & stack:

/acre costs for 6 person crew, chainsaw operation, a 60Hp tractor w an 18' flat- bed trailer, fuel, repairs & maint. are: -6*\$5.50/hr*10hrs/day*4days/ac(15cords/10 hrs & 60cords/acre, therefore 4days/acre) *37.25acres for 149 harvest days(5.5mo.); Labor	49170	-----
-4 chainsaws @ \$3/cord * 60cords/acre * 37.25/4(each one cutting 1/4 of acreage);Chainsaws	6984	-----
-60Hp tractor, 3hrs/day@\$9.20/hr*149days; Tractor	4112	-----
-18'flatbed trailer, 3hrs/day@\$0.75/day* 149days; Trailer	335	-----
-3gal.fuel/hr for tractor*3*149*\$0.83/gal; D.Fuel	1113	-----
-Repair & maint. of tractor & trailer @ \$1.15/hr*3hrs/day*149days; R.&Maint.	514	-----
Sub-Total of Harvest Costs:	62228	-----
Per Acre:	1556	-----

Interest on Operating Capital To Harvest
based approx. on 1/5 of the \$ borrowed
each mo. for 5 mo. then repaid as sales
begin w the wood cut in the 1st mo.
which will then be dry (12% used):

Total of Harvest Costs:	63925	-----
Per Acre:	1598	-----

Marketing Costs:

In the 6th mo. of yr 11 product sales will begin w the marketing of the wood first cut; this wood will be dry by then;

-advertisement and/or marketing channel establishment on a wholesale or retail basis; direct retail mkt'ing is assumed here with newspaper ads once/wk for 5mo @ \$25/wk for 20 wks;

500 -----

Delivery costs are based on an assumed ave. distance of 50 miles/cord costing \$0.25/mi. or \$12.50/cord *60cords/acre*37.25acres & include an estimate for all costs; no interest charge is made-sales should finance marketing operations:

27938 -----

Total Marketing Costs: 28438 -----

Per Acre: 711 -----

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Tot. Undiscounted Prod., Harvest & Mk'ting Costs: 110803 -----

Per Acre: 2770 -----

PV of Total Costs of Prod., Harvest and Marketing: 42674 -----

(using 12% interest) Per Acre: 1067 -----

RETURNS FROM FIRST CUTTING:

USDA/CRP contract payments @ \$48/ac/yr *40acres * 10 years:

19200 -----

Per Acre: 480 -----

Marketing receipts are assumed to range between \$125/cord & \$150/cord for an average price of \$137.50/cord*60*37.25:

307313 -----

Per Acre: 7683 -----

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Total Revenue From All Income: 326513 -----

Per Acre: 8163 -----

Total PV of Returns from all Income: 99195 -----

(using 12% interest) Per Acre: 2480 -----

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** Undiscounted Net Profit or Loss from 1st Cutting Before taxes and with Annual CRP Payments **

215710 -----

Per Acre: 5393 -----

** Discounted Net Profit or Loss from 1st Cutting Before taxes and with Annual CRP Payments **

56521 -----

Per Acre: 1413 -----

Note: The analysis to here doesn't include consideration of the added incentive provided by the ASCS. The ASCS is authorized to make cost/share payments to growers, which vary by county committee, for part of the costs of tree establishment on CRP eligible land. Cost-sharing is authorized for up to, but not to exceed 50%

of the agricultural market value of the land. A quick survey of agricultural real estate companies regarding the value of CRP eligible ground in Kings county indicated that such land is currently between \$400 and \$800/acre. Thus, the market value of eligible land will not likely prevent individuals from receiving, for example, a fifty percent reimbursement for the costs of tree establishment. This would obviously make tree farming on CRP land an even more attractive investment.

Costs/Returns When Including ASCS Cost Share Payments for 50% of the Establishment Costs During First Year; 1st yr establishment costs are reduced from \$14038.50 to \$7019:

Cost Savings: 7019
Per Acre: 175

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** Undiscounted Net Profit or Loss from 1st Cutting Before Taxes & w CRP & ASCS Cost/Share Payments **
Per Acre: 222729
5568
** Discounted Net Profit or Loss from 1st Cutting Before Taxes & w CRP & ASCS Cost/Share Payments **
Per Acre: 62788
1570

DED COSTS FOR SECOND CUTTING:

Whinning during year 12:
10 person crew for five 8hr days @ \$5.50/hr: 2200
Per Acre: 55
Annual misc. expense of \$20/yr, yrs 13-17: 100
Per Acre: 3

Harvest Costs:

Year 18 harvest costs same as for yr. 11
-6*\$5.50/hr*10hrs/day*4days/ac(15cords/10 hrs & 60cords/acre, therefore 4days/acre)
+37.25acres for 149 harvest days(5.5mo.); Labor 49170
-4 chainsaws @ \$3/cord * 60cords/acre * 37.25/4(each one cutting 1/4 of acreage); Chainsaws 6984
-60Hp tractor, 3hrs/day@\$9.20/hr*149days; Tractor 4112
-18' flatbed trailer, 3hrs/day@\$0.75/day* 149days; Trailer 335
-3gal.fuel/hr for tractor*3*149*\$0.83/gal; D.Fuel 1113
-Repair & maint. of tractor & trailer @ \$1.15/hr*3hrs/day*149days; R.&Maint. 514
Sub-Total of Harvest Costs: 62228
Per Acre: 1556

Interest on Operating Capital To Harvest based on approx. 1/5 of the \$ borrowed each mo. for 5 mo. then repaid as sales begin with the wood cut in the 1st mo. which will then be dry (12% used): Interest 1697
Total of Harvest Costs: 63925
Per Acre: 1598

Marketing Costs:

In the 6th mo. of yr 18 product sales will begin w the marketing of the wood first cut; this wood will be dry by then;

-advertisement and/or marketing channel establishment on a wholesale or retail basis; direct retail mkt'ing is assumed here with newspaper ads once/wk for 5mo @ \$25/wk for 20 wks;

500 -----

Delivery costs are based on an assumed ave. distance of 50 miles/cord costing \$0.25/mi. or \$12.50/cord +60cords/acre+37.25acres & include an estimate for all costs; no interest charge is made-sales should finance marketing operations:

27938 -----

Total Marketing Costs: 28438 -----

Per Acre: 711 -----

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Tot. Undiscounted Added Costs of Prod/Harv't & Mk'ing: 94663 -----

Per Acre: 2367 -----

PV of Tot. Added Costs of Prod., Harvest and Mk'ing: 12594 -----

(using 12% interest) Per Acre: 315 -----

ADDED RETURNS FROM SECOND CUTTING:

Marketing receipts are assumed to range between \$125/cord & \$150/cord for an average price of \$137.50/cord+60+37.25:

307313 -----

Per Acre: 7683 -----

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Total Revenue From 2nd Cutting: 307313 -----

Per Acre: 7683 -----

Total PV of Returns from 2nd Cutting: 39963 -----

(using 12% interest) Per Acre: 999 -----

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** Undiscounted Net Profit or Loss Before Taxes from 2nd Cutting **

212650 -----

Per Acre: 5316 -----

** Discounted Net Profit or Loss Before Taxes from 2nd Cutting **

27369 -----

Per Acre: 684 -----

ADDED COSTS FOR THIRD CUTTING:

Thinning during year 19:

10 person crew for five 8hr days @ \$5.50/hr: 2200 -----

Per Ac Cost: 55 -----

Annual misc. expense of \$20/yr, yrs 20-25: 120 -----

Per Acre: 3 -----

Harvest Costs:

Year 26 harvest costs same as for yr. 11

-6*\$5.50/hr*10hrs/day*4days/ac(15cords/10 hrs & 60cords/acre, therefore 4days/acre)			
+37.25acres for 149 harvest days(5.5mo.);	Labor	49170	-----
-4 chainsaws @ \$3/cord + 60cords/acre + 37.25/4(each one cutting 1/4 of acreage);	Chainsaws	6984	-----
-60Hp tractor, 3hrs/day@\$9.20/hr*149days;	Tractor	4112	-----
-18'flatbed trailer, 3hrs/day@\$0.75/day*149days;	Trailer	335	-----
-3gal.fuel/hr for tractor*3*149*\$0.83/gal;	D.Fuel	1113	-----
-Repair & maint. of tractor & trailer @ \$1.15/hr*3hrs/day*149days;	R.&Maint.	514	-----
	Sub-Total of Harvest Costs:	62228	-----
	Per Acre:	1556	-----

Interest on Operating Capital To Harvest based on approx. 1/5 of the \$ borrowed each mo. for 5 mo. then repaid as sales begin with the wood cut in the 1st mo. which will then be dry (12% used):

	Interest	1697	-----
	Total of Harvest Costs:	63925	-----
	Per Acre:	1598	-----

Marketing Costs:

In the 6th mo. of yr 18 product sales will begin w the marketing of the wood first cut; this wood will be dry by then;

-advertisement and/or marketing channel establishment on a wholesale or retail basis; direct retail mkt'ing is assumed here with newspaper ads once/wk for 5mo @ \$25/wk for 20 wks;		500	-----
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Delivery costs are based on an assumed ave. distance of 50 miles/cord costing \$0.25/mi. or \$12.50/cord +60cords/acre+37.25acres & include an estimate for all costs; no interest charge is made-sales should finance marketing operations:

	Total Marketing Costs:	27938	-----
	Per Acre:	711	-----

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Tot.Undiscounted Added Costs of Prod/Harv't & Mk'ing:		94683	-----
	Per Acre:	2367	-----
PV of Tot. Added Costs of Prod.,Harvest and Mk'ting:		5130	-----
(using 12% interest)	Per Acre:	128	-----

ADDED RETURNS FROM THIRD CUTTING:

Marketing receipts are assumed to range between \$125/cord & \$150/cord for an average price of \$137.50/cord*60*37.25:

Total of PV of Returns from Mkt. Receipts:	307313	-----
(using 12% interest)	16140	-----
Per Acre:	404	-----

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 ** Undiscounted Net Profit or Loss Before Taxes from 3rd Cutting **

	212630	-----
Per Acre:	5316	-----

** Discounted Net Profit or Loss Before Taxes from 3rd Cutting **

	11010	-----
Per Acre:	275	-----

Total Discounted Net Profit or Loss (Net Present Value) Before Taxes for the entire 26 Year Rotation When ASCS Cost/Share and CRP Payments are Included:

	101167	-----
(using 12% interest)	2529	-----
Per Acre:		-----

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 *** TOTAL AVERAGE ANNUAL PROFIT FOR 26 YEAR TREE CROP INVESTMENT WITH ASCS COST/SHARE ASSISTANCE AND ANNUAL CRP PAYMENTS ***

	12813	-----
Per Acre:	320	-----

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Regular CRP Contract Etimated Costs/Returns

Estimated Costs/Returns from a Regular CRP Contract:

Costs: annual control of noxious weeds using Roundup or other similar herbicide @ \$68/gal, 1pt/ac=\$4.25/pt*40acres plus \$4.90/acre to apply*40acres:

	366	-----
Per Acre:	9	-----

Returns: annual CRP payment of \$48/acre * 40 acres:

	1920	-----
Per Acre:	48	-----

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 Undiscounted Net Profit/Year:

	1554	-----
Per Acre:	39	-----

Discounted Net Profit (PV if not reinvested):

	8780	-----
(using 12% interest)	220	-----
Per Acre:		-----

Discounted Net Profit (PV if reinvested at 6% as an annuity each year):

	11438	-----
Per Acre:	286	-----

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 *** TOTAL AVERAGE ANNUAL PROFIT FOR 10 YEAR PARTICIPATION IN THE REGULAR CONSERVATION RESERVE PROGRAM (Profits Reinvested) ***

	2024	-----
Per Acre:	51	-----

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CRP Treecrop Cashflow Budget For 40 Acres
(Undiscounted Cash Flow)

(Annual Balance Plus Interest)

Year	Expenditures	Revenues	Annual Balance	Accumulated Balance	Interest Factorage	Projected Balance
1	14038	8939	-5099	-5099	1.12	-5711
2	2541	1920	-621	-5720	1.12	-6406
3	20	1920	1900	-3820	1.12	-4278
4	20	1920	1900	-1920	1.12	-2150
5	20	1920	1900	-20	1.12	-22
6	20	1920	1900	1880	1.06	1993
7	20	1920	1900	3780	1.06	4007
8	20	1920	1900	5680	1.06	6021
9	20	1920	1900	7580	1.06	8035
10	20	1920	1900	9480	1.06	10049
11	90656	307313	216647	226127	1.06	239695
12	2200	0	-2200	223927	1.06	237363
13	20	0	-20	223907	1.06	237341
14	20	0	-20	223887	1.06	237320
15	20	0	-20	223867	1.06	237299
16	20	0	-20	223847	1.06	237278
17	20	0	-20	223827	1.06	237257
18	90656	307313	216647	440474	1.06	466902
19	2200	0	-2200	438274	1.06	464570
20	20	0	-20	438254	1.06	464549
21	20	0	-20	438234	1.06	464528
22	20	0	-20	438214	1.06	464507
23	20	0	-20	438194	1.06	464486
24	20	0	-20	438174	1.06	464464
25	20	0	-20	438154	1.06	464443
26	90656	307313	216647	654801	1.06	694089

* Revenue for year one includes \$1,920 CRP payment and \$7,019 reimbursement from ASCS for 50% of the establishment costs. Revenue for years 2 through 10 represent annual CRP payments only. Revenue for years 11, 18, and 26 represent market receipts only.

** Interest factors for years one through year five based on 12% per year. This reflects the assumed cost of borrowed capital to finance operations until year six when the cash flow becomes positive and operations are presumed to be self-financing. From year six onward the interest factors are based on 6% per year. Six percent represents a presumed earnings capability of capital. In this example, the -\$5,711 at the end of year one represent the future value of year one's ending balance when paying 12% interest. Thus the \$612 difference between year one's accumulated balance and the corresponding projected balance is equal to the interest cost of fully financing the deficit for one year. Conversely, the \$694,089 found in the bottom right hand corner of the table represents the total projected future value of year 26's accumulated balance.

