

COLCO 2

(An Update of LIRA'S Contract Logging Costing Program.)

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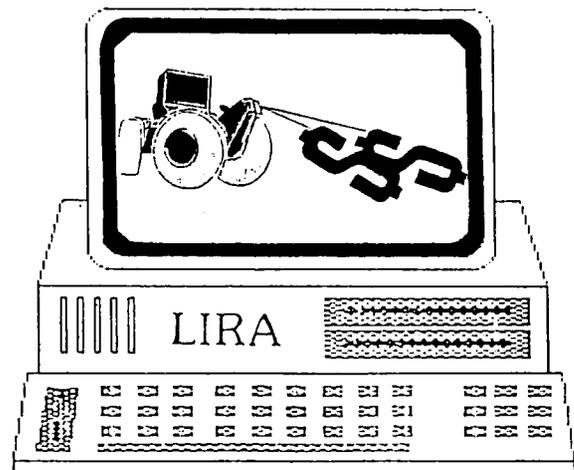
ABSTRACT

This report outlines the Contract Logging Costing program, COLCO 2. The costing program is based on the format detailed in the LIRA Costing Handbook for Logging Contractors (Wells, 1981) and is specifically designed for the New Zealand logging industry. The program has the capacity to store the cost information of up to 13 machines and three labour payment systems.

INTRODUCTION

As contract logging is a capital intensive business with slim profit margins, it is essential that the contractor, and those who provide financial services to the contractor, have a good understanding of the many costs involved in running a logging business.

Since publication in 1981, the LIRA Costing Handbook for Logging Contractors has become accepted by many as a standard procedure with which to cost contract logging rates. The need to automate the many calculations involved in the handbook format was first recognised with COLCO (Gaskin, 1983). With the development of computer software in recent years and in particular with the advent of spreadsheets, a powerful tool has become available which allows more flexibility in calculating contract logging rates.



COLCO 2

The program is written on the SUPERCALC4 spreadsheet program but is also available on LOTUS 1,2,3, and SUPERCALC3.

Throughout the program the operator is offered a series of choices to move around the program. The operator is directed by an arrow to input the values required to calculate the total daily cost. Any input which is to be changed is done by moving directly to the input and overtyping the existing entry. Full operating instructions are detailed in the operating manual (available with a copy of the program from LIRA).

The program is divided into four sections:

- | | |
|-----------------------------|-------------------|
| | Cell
Reference |
| 1. Machine Costing | (=A25) |
| 2. Labour Costing | (= L) |
| 3. Operating Supplies Costs | (= S) |
| 4. A Summary of Costs | (= AS) |

& M costs, for example), the program provides some guidelines adjacent to the input cell.

COLCO2 provides nine graphs in the SUPERCALC3 + 4 version of the program (A separate graphics package is required for LOTUS 1, 2, 3) which include :

- 7 graphs of machine cost structures
- 1 of the labour cost structure (Table 2)
- 1 summary graph (Figure 1)

MACHINE COSTING

Specific machine types which can be costed at present include:

- | | |
|----------------------|-------------------|
| | Cell
Reference |
| a) Skidders | (3) (= A49) |
| b) Front-end Loaders | (3) (=A1200) |
| c) Tractors | (3) (= A600) |
| d) Hauler | (1) (=A1800) |

The program however, is not restricted to these types of machines. In fact any type of logging machinery can be costed using one of these formats.

Estimates from the contractor's own experience are always preferable as data inputs, but if these are not readily available (R

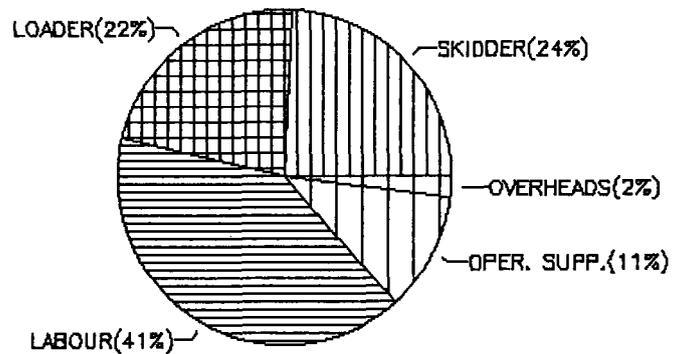


Figure 1 - Total Gang Cost Structure

Table 1 - Summary of Skidder Costs

SKIDDER PURCHASE PRICE -----> 160000
 SKIDDER LIFE IN YEARS -----> 5
 SKIDDER RESALE VALUE -----> 35000
 PRODUCTIVE HOURS PER YEAR -----> 1527.5

SKIDDER OWNING COSTS: (\$/HR)

DEPRECIATION -----> 15.06
 COST OF CAPITAL -----> 13.32
 INSURANCE -----> 1.08
 TOTAL OWNING COSTS -----> 29.46

SKIDDER OPERATING COSTS (\$/HR)

FUEL -----> 8.75
 TYRES -----> 3.33
 RIGGING -----> 1.90
 REPAIR & MAINTENANCE -----> 12.05
 TOTAL OPERATING COSTS -----> 26.03

TOTAL HOURLY COSTS -----> 55.49
 TOTAL DAILY COST -----> 360.69

BASED ON 6.5
 PROD HRS/DAY

MONTHLY REPAYMENT FOR SKIDDER:

BASED ON AN INTEREST RATE OF -----> 21 % PA
 OVER A REPAYMENT PERIOD OF -----> 5 YEARS
 AND A DEPOSIT OF -----> 30000 DOLLARS
 REPAYMENT PER MONTH = 3516.94 \$/MONTH

Calculations within the program all follow those in the handbook. For example, depreciation is based on the straight line method :

Depreciation per hour =

$$\frac{\text{Delivered price - (cost of tyres + resale value)}}{\text{Service life in hours}}$$

(A thorough explanation of depreciation is given by Liley, 1987).

At the end of the machine costing section, the operator is able to print out a summary of the machine's daily cost (Table 1). A quick calculation of monthly repayments can be made at the end of each machine cost section.

LABOUR COSTING

Three payment systems are provided as options for the costing of labour:

- Wages
- Piece Rate
- Wages with a Piece-Rate Bonus

For each worker, the operator inputs the hourly wage and years of service (for calculation of holiday pay). All various levies and allowances are entered as directed.

Table 2 - Hourly Rate Labour Costing Format

Position in Gang	No in Gang with 5 or more years of service		Hourly Rate
	No	No	
Owner	1	1	14.42
Foreman	0	0	0
Faller	1	0	10.00
Breakerout	0	0	0
Skidder Oper	1	0	10.00
Tractor Oper	0	0	0
Hauler Driver	0	0	0
Loader Driver	1	0	10.00
Skiddy	1	0	10.00
Scaler	0	0	0
Other	0	0	0

As with machine costing, the operator may wish to cost all three labour payment systems by

way of comparison, and then choose which system is to be used for the daily rate calculation (the choice of the system of payment to be used is made in the final section).

The labour costs are calculated as the average daily cost per man per year but are being finally expressed as a Cost per Gang per Day (Table 2).

OPERATING SUPPLIES

This section calculates on a daily basis:

- Gang Transport Cost
- Chainsaw Costs
- Miscellaneous Operating Supplies

Transport costs are based on the kilometre rate (\$/km) as per the Government Schedule. Chainsaw costing may be done on the daily chainsaw rate, either including fuel or excluding fuel (the fuel can then be costed separately).

SUMMARY OF COSTS AND THE UNIT RATE CALCULATION

In the final section (Table 3) the previously determined daily costs are summarised. The user then chooses the machine(s) and labour payment system appropriate to a particular logging operation. At this stage the user inputs :

1. Overheads (accountant, telephone, etc.)
2. Profit (both input as a percentage of total daily cost).

Finally, the expected daily production is input to calculate the contract price per m³.

All inputs may be viewed or changed at any time and outputs of any section can be produced as required.

DISCUSSION

The spreadsheet format of COLCO 2 is well suited to provide the flexibility required in a costing program, and can be readily

Table 3 - Summary of Costs

MACHINE COSTS: (\$/DAY)			MODEL OF MACHINE	ENTER (1) IF MACHINE IS TO BE INCLUDED IN DAILY GANG COST
1.	SKIDDER NO 1 ----->	360.69	1	1
2.	SKIDDER NO 2 ----->	115.93	2	0
3.	SKIDDER NO 3 ----->	381.74	3	0
1.	FRONT END LOADER NO 1 ->	349.12	1	1
2.	FRONT END LOADER NO 2 ->	279.69	2	0
3.	FRONT END LOADER NO 3 ->	591.66	3	0
1.	TRACTOR NO 1 ----->	324.32	1	0
2.	TRACTOR NO 2 ----->	367.94	2	0
3.	TRACTOR NO 3 ----->	609.46	3	0
1.	HAULER ----->	1,070.37	1	0
				ENTER (1) FOR CHOSEN METHOD OF PAYMENT
LABOUR COSTS: (\$/DAY)				
	HOURLY RATE ONLY ----->	684.28		1
	HOURLY RATE & BONUS ----->	139.18		0
	PIECE RATE ONLY ----->	370.00		0
OPERATING SUPPLIES: (\$/DAY)->			160.02	
OVERHEADS (AS A % OF TOTAL JOB COST)----->			2	
	OVERHEADS ----->	31.08		\$/DAY
PROFIT:				
	AS% OF JOB COST ----->	0		
	PROFIT ----->	.00		\$/DAY

TOTAL DAILY GANG COST ----->			1,585.20	\$/DAY

EXPECTED DAILY PRODUCTION -->			210	TONNES OR M ³ /DAY

COST OF PRODUCTION PER M ³ -->			7.55	\$ PER TONNE OR M ³

modified by the operator to meet particular requirements. The ability to determine the sensitivity of any input on the total cost is particularly useful when dealing with items such as interest rates.

As with any such exercise, the quality of the output will only reflect the quality of the inputs, and wherever possible data based on personal experience and records should be used.

REFERENCES

Gaskin, J.E. (1983) : "COLCO - A Computer Program for Logging Costing" LIRA Report Vol 8 No 9.

Liley, W.B. (1987) : "Depreciation", LIRA Report Vol 12 No 8.

Walker K. (1976) : "The Principles and Practices of Costing as applied to Log Harvesting Systems Management", NZFS Forest Research Institute, Economics of Silviculture Unpublished Report No 87.

Wells, G.C. (1981) : "Costing Handbook for Logging Contractors", LIRA.

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