



# Forest Products Finances

by Chad Bolding, Dale Green and Tom Straka

## Break-Even Analysis

Volume 16, Number 7 - March 2008

**A** basic question in any logging operation is, "How much production do we need to cover costs and start making a profit?" Often, the question is asked for different time

frames. Weekly, monthly, quarterly and annual break-even levels can all be useful. Loggers often use this analysis to determine a minimal load per week target in managing their operation. Longer time periods, such as a month or a quarter, are more often used to handle weather effects and ensure that periodic costs are considered.

The distinction between fixed and variable costs is important here. Fixed costs do not vary with the amount of wood produced or the time worked. They are fixed for each week, month or year. On the other hand, variable costs are directly influenced by the amount of wood produced or the amount of time worked. The concept of fixed and variable costs seems simple, but it can be confusing to some managers.

For logging operations, some standard cost categories:

#### Fixed Costs:

- Salaries and Owner's Labor
- Equipment Payments
- Overhead Cost
- Insurance (except Workers' Comp)
- Licenses and Taxes

#### Variable Costs:

- Hourly Labor
- Workers' Compensation Insurance
- Fuel, Tires and Repairs
- Contract Hauling

The key is to summarize costs in a way that works for you as long as fixed costs and variable costs are kept separate. Plus, to perform break-even calculations you will also need to know operating days per year and the

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annual tons produced. Recall the key production factors discussed last month:

**Loads delivered per day X Days worked per year X Tons hauled per load = Tons per year.**

**Break-even level**

Break-even level is best illustrated with an example. Consider a logging contractor who worked 235 days last year and produced 56,594 tons (nine to 10 loads per day, or 241 tons). Total expenses are \$760,233 (\$13.43 per ton) and separate out as \$356,771 of fixed costs and \$403,462 of variable costs. Since the contractor worked 235 days per year, fixed costs were \$1,518 per day. Since 56,594 tons are produced per year, variable costs are \$7.13 per ton.

If he was paid \$14 per ton, how many tons did he need to produce each day to break-even? If the price per ton is \$14 and variable costs are \$7.13 per ton, then each ton contributes \$6.87 towards covering fixed cost (\$14 - \$7.13 = \$6.87).

He needs to produce enough tons to bring the daily fixed cost of \$1,518 down to \$6.87 per ton. To find this, we divide the fixed cost per day (\$1,518) by \$6.87 per ton and the result is the break-even level of 221 tons. The operation becomes profitable once a day's production exceeds 221 tons.


If you are paid \$14 per ton, how many loads do you need to produce per week to break-even? If we assume a 50-week working year, he worked 4.7 days per week (235 days divided by 50 weeks). He also needs to know his average truck payload (we will use 25 tons). Weekly breakeven is simply 221 tons per day times 4.7 days per week divided by 25 tons per load, or 42 loads.

What happens to costs if weather or markets limit working days? Or, what if production per day is limited? Worse yet, what if both happen? Below is the price per ton necessary to break-even at various ton per day production rates and various annual operating days per year levels. As you'd expect, as tons per day or annual operating days increase, the price where the operation breaks even decreases. Both interact positively, so the lowest price is in the lower right-hand side of the table (where highest production rate and operating days per year levels occur).

*Continued on page 20*


Dollars per ton break-even price.						
Operating Days per Year						
Tons per Day	235	240	245	250	255	260
175	15.80	15.62	15.45	15.28	15.12	14.97
200	14.72	14.56	14.41	14.26	14.12	13.99
225	13.88	13.73	13.60	13.47	13.35	13.23
250	13.20	13.07	12.95	12.84	12.72	12.62
275	12.65	12.53	12.42	12.32	12.22	12.12
300	12.19	12.08	11.98	11.89	11.79	11.70

## IGLAND Forestry Winches




**IGLAND 3001.** Small and basic winch for the "hobby forester" with a small parcel of woodland. Ideal for hauling in firewood.

- For tractors over 25 hp.
- Max pulling capacity 5,380 lbs.
- Recommended wire rope 5/16" x 130'
- Height 48", Width 40", Weight 330 lbs.




**IGLAND 6001.** 13,650 lbs. of pull definitely puts this winch into the super heavy duty class. Large drum capacity accommodates a generous length of heavy cable (up to 295' of 1/2"). Simple design, solid construction, low center of gravity and a clear view from the tractor seat. The trapezoidal base plate provides maximum ground support during winching and is ideal for attacking logs. High and low spooling points are standard.

- For tractors 80 to 180 hp.
- Height 72", Width 70", Weight 880 lbs.




**IGLAND 4001.** Strong and stable, this winch has a simple design and operation making it ideal for beginners to the woods. The addition of a top pulley and remote control can make the IGLAND 4001 a perfect compact winch for the professional.

- For tractors 35 to 70 hp.
- Max pulling capacity 5,580 lbs.
- Recommended wire rope 3/8" x 165'
- Height 52", Width 50", Weight 445 lbs.



**IGLAND 5001.** Brute force and efficiency provide total control over the load under the most challenging conditions. The IGLAND 5001 is a heavy duty design intended for the professional and the daily stress of skidding big timber. The low profile construction of the winch keeps the rear overhang to a minimum.

- For tractors 60 to 90 hp.
- Maximum pull capacity 10,800 lbs.
- Recommended wire rope 7/16" x 195'
- Height 61", Width 60", Weight 630 lbs.



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# Break-Even Analysis

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Figure 1 shows the relationship described in Table 1. At any annual operating day level, break-even price decreases with production level. At \$14 per ton, breakeven takes place at about 200 tons per day for a 260-day operating year, but rises to 221 tons per day when the number of operating days falls to 235. While the number of operating days is important, daily production (particularly that final load each day) is critical.

## Summary

Once a logger knows the operation's break-even level, fixed and variable costs, and target days and tons, he can evaluate how outside changes will affect costs and profits. This information can be used to anticipate changes or to evaluate changes the logger is considering in his operation. The logger's break-even level will depend on logging rate, fixed costs, variable costs, days worked, loads per day and tons per load.

The relationships described above point out the key factors that impact profitability. Some factors the logger has control over, and by optimizing those factors he can control his firm's profitability to a great degree. This means he will want to maximize the

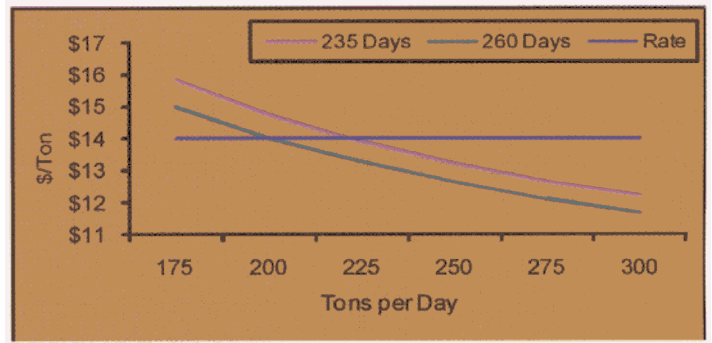


Figure 1. Impact of operating days and production level on break-even level (\$14 per ton rate).

number of loads per day, maximize average truck payloads, minimize fixed costs, maximize the number of operating days, and reduce production variability.

FPE

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## Financial Questions?

Here is your opportunity to address specific financial decision questions that relate to forestry or equipment situations. Future columns can address issues raised by the readers. If you have a specific problem, include the variables like cost, interest rate, cash flow timing, etc. Questions and problems can be e-mailed to [fpeletters@MooseRiverMedia.com](mailto:fpeletters@MooseRiverMedia.com).

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**ON THE COVER:**

Bucky Colburn is peeling 1/36-inch thick rotary hardwood veneer on a Coe 263 lathe in Newport, Vt. The veneer is cut into a continuous ribbon to be clipped to size and dried. The veneer will be sold to produce hardwood plywood. Columbia Forest Products has three other veneer mills and is North America's largest manufacturer of hardwood plywood and veneer.  
Cover by Bob M. Montgomery.