

## **Sawmill Economic Model Computer Program Help File.**

### **Please read before running program.**

#### **Purpose:**

The intended use of this program is to assist in making operational and business decisions in running a small sawmill operation. It is particularly geared towards answer the questions of whether the addition of an edger or another employee is justified economically. However, it could also be used to help determine the economic effects of purchasing different equipment or changing the production situation.

#### **Disclaimer:**

This program has been designed to be comprehensive and the calculations have been verified when possible, however it is still possible that there are defects or errors embodied in the code. The creators and distributors of this software explicitly do not guaranty the correctness of any results generated by this program. **By running this program, the user agrees to the following statements:** The user assumes full responsibility for understanding all limitations of the results generated by this program. Any and all results from this model used in making business decisions should be checked by independently performed calculations. By using this program the user agrees not to hold Nathan Post, Clarkson University and all of it's affiliates, Sawmill and Woodlot Magazine, and other organizations associated with modifying or distributing this program liable in any way for any errors or business failure incurred by using this software, or for any and all damage to person or property, including damage to computer systems or data incurred during or after the use of this program.

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**Created by: Nathan Post at Clarkson University with assistance from Dr. Steven Yurgartis at Clarkson and Irwin Post at Good Wood Ltd.  
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#### **Requirements:**

This program has been tested in Microsoft Excel version X for the Macintosh. It should also perform correctly in: Microsoft Excel 97 or later for Windows or Microsoft Excel 98 or later for Macintosh.

The program may operate correctly in older versions of Excel, however it has not been tested as such. Translation to other spreadsheet software is not recommended.

#### **Operation notes:**

To run program double click on program icon or from Excel go to the file menu and select open and locate the program. Basic knowledge of how to use Excel is assumed in these instructions.

**Note that upon opening, Excel will tell you that the workbook has automatic links to another worksheet and asks if you want to update them. CLICK NO. This is a result of how the model was created, however, no external links remain in the workbook and it all calculations will still perform correctly.**

The worksheets located in this file provide all data entry locations, calculations and results. Each worksheet can be printed on one page, however you should check the page setup and printer options before printing.

**The worksheets in the order presented are:**

- Program Information Includes disclaimer and additional release notes.
- Log Data Sheet Blank sheet for collecting data at the mill. Print one copy to use for each log sawn
- Volume Calculation Calculates the total lumber volume in board feet based on the individual boards entered. Example calculation is presented first.
- Raw Data 1 Enter data for each log you saw on this sheet
- Raw Data Example 1 An example of one sawmill's data where the flitches from each log were edged immediately after the log was sawn
- Raw Data Example 2 Another example of sawmill data, this time with edging performed in batches for a number of logs
- Data Summary The data entered and the two examples are summarized. This sheet provides some of the values to be entered as inputs to the computer model.

**This is the start of the computer model:**

- A - Fixed Cost Operation constants related to *fixed costs* are entered here.
- B1 - Blade Cost This sheet is used to calculate the average blade cost for the sawmill and the edger including resharpening.
- B - Variable Cost Operation constants relating to *variable costs* are entered here.
- Edging Speed Worksheet This sheet is optional and is for estimating the speed of a separate edger when none is available for direct measurement. Note that the results of this page must be selected and entered in the *Main Input & Output* sheet
- C - Main Input & Output This sheet includes the main operation inputs and summary of program outputs.

**Automatic calculations are performed on these sheets:**

- D - Calc1 Fixed cost calculations.
- E - Calc2 Variable cost calculations.
- F - Calc3 Summary of inputs and main program calculations.

Sheets with names preceded by a letter A through F are linked together in by the program calculations. Only changes to numbers on these sheets will affect the program results. Program operation data information is entered in A through C. The Edging Speed sheet can be used separately to generate edger speed values to enter into sheet C. No changes should be required in sheet D, E, and F unless you plan on modifying the way the program works. Results are displayed in worksheets C and F. **Only cells highlighted in yellow should be changed.** **Results are highlighted in pink.** All other numbers are intermediate calculations. The units required are listed next to each value (see unit key below).

**Key to words used:**

<b>Constant</b>	‘Constant’ is used in the mathematical context to indicate a numerical quantity that must be entered and is subsequently used in calculations.
<b>Exclusive</b>	Exclusive operations refer to the situation where a sawmill is run and flitches are set aside to be edged later while the sawmill is not running.
<b>Fixed Cost</b>	Economic definition of fixed costs: Annual expenses that do not depend on how much time machinery is run or how much product is produced.
<b>Simultaneous</b>	Simultaneous operation refers to the situation where a sawmill and edger are run in tandem with flitches being edged as soon as they come off the mill. This type of operation typically requires a minimum of 3 people.
<b>Symbol</b>	‘Symbol’ is the alphanumeric code assigned to each Constant, Value or Variable (see key below). Symbols are used to represent their corresponding value or variable in calculations formulas.
<b>Value</b>	The word 'value' is used in the mathematical context to indicate a numerical quantity that must be entered. These numbers are also indicated as ‘constants’ in some locations.
<b>Variable</b>	'Variable' is generally used in a mathematical context to indicate a calculated value that can vary depending on the parameters entered in the program. However, the term ‘variable cost’ refers to the economic definition of variable cost, meaning any cost that directly correlates to the number of hours an operation is performed.

**Key to symbols:**

Value, variable and constant symbols are based on the worksheet letter followed by the row number in which they are entered or calculated. A subscript of 's', 'e', or 'se' is added to refer to a specific operation type:

- s corresponds to the sawmill or to a sawmill only operation
- e corresponds to an edger or to an operation with edger and sawmill run exclusively of each other
- se corresponds to an operation with an sawmill and edger run simultaneously.

Separate columns are used for entering values corresponding to the different situations. Thus, the subscript letter can be thought of as indicating a specific column.

**Example:**

Constant 'A5' is the comprehensive insurance rate. It is entered on Sheet A, row 5.

Constant 'A13s' is the life of the sawmill while Constant 'A13e' is that of the edger.

**How to enter numerical values:**

**Note: Pay attention to units.** Not all units are standard, so be sure to convert numbers to the listed units before entering them (see key below for abbreviations).

Numbers corresponding to a countable quantity should be entered as an integer value (ie. The number of people, or the number of blades on a machine). All other numbers are floating point and should be entered as accurately as possible.

Numbers containing a currency (\$) are automatically prefixed with a '\$'. The program was designed around the US Dollar, however other currencies may be used if you ensure that all values containing a currency amount are converted correctly.

All values indicated as a percent are entered as such. Excel automatically converts the number to the decimal equivalent.

Example: If the number entered is 10% it will be calculated as having a value of 0.10.

**Remember to only enter numbers in locations highlighted in yellow.**

**Key to Abbreviations for Units**

Unit Abbreviation	Unit in words
BF	Board Feet (either log-scale or finished lumber)
LF	Lineal Feet (board or flitch length)
min	Minute (time)

hr	Hour (time)
yr	Year (time period)
%	Percent (fraction multiplied by 100)
gal	Gallon (unit of volume).
-	No unit (typically an integer quantity)

### **Program Use:**

To Use Program, Enter all values in sheets A, B1, B and C. Resulting outputs are displayed at the bottom of sheet C with intermediate values in Sheet F.

Note that cost and profit calculations only include the sawmill and edger (for w/ edger numbers). The cost of owning and operating other equipment, buildings, etc. required for your business are not included and must be deducted from the profits to estimate your actual profits.

If you include yourself on your payroll, then include yourself in the number of employees. If you do not include yourself in payroll, do not include yourself in the number of employees; however realize that your only compensation will be from profits (after taxes).

Note that all profits are BEFORE applicable taxes.