

Table S4. Cost calculator for delimber

| | A | B | C |
|----|---|------------------|-------------|
| 1 | | Delimber | |
| 2 | Time | Base year | |
| 3 | Production | Non-Frozen | Frozen |
| 4 | Annual Production (m ³) | 750,000 | 1,400,000 |
| 5 | Days | 106 | 83 |
| 6 | Hours/Day | 21 | 19 |
| 7 | Input | | |
| 8 | Annual Available Hours | 2,226 | 1,577 |
| 9 | Utilization Percentage [42] | 90 | 90 |
| 10 | Annual Production Hours | 2,003 | 1,419 |
| 11 | Expected Life (Years) [49] | 5.00 | |
| 12 | Purchase Information | | |
| 13 | Equipment Purchase Cost (\$) [45] | 300,000 | |
| 14 | Salvage Value (%) [49] | 0.20 | |
| 15 | Fuel Price (\$) [41] | 1.00 | |
| 16 | Oil Lube Costs (%) [41] | 0.10 | |
| 17 | Insurance Costs (%) [41] | 0.035 | |
| 18 | Load Factor | 0.25 | |
| 19 | Salvage Value (\$) | 60,000 | |
| 20 | Rate of Return on Total Capital | 180,000 | |
| 21 | Average Annual Equipment Value (\$) | 0.10 | |
| 22 | Fuel Consumption (lt/hr) [50] | 21.00 | 23.00 |
| 23 | Ownership Costs | | |
| 24 | Depreciation (\$/year) | 48,000 | |
| 25 | Insurance (\$/year) | 6,300 | |
| 26 | Return on Capital (\$/year) | 18,000 | |
| 27 | Annual Ownership Costs (\$/year) | 72,300 | |
| 28 | Total Ownership Costs (\$/year) | 2,675,100 | |
| 29 | Total Ownership Unit Cost (\$/m³) | 1.24 | |
| 30 | Labor Costs | | |
| 31 | Straight Time | 1,908 | 1,494 |
| 32 | Overtime Worked | 318 | 83 |
| 33 | Wage (\$/hr) [32] | 29.29 | 29.29 |
| 34 | Overtime (\$/hr) | 43.94 | 43.94 |
| 35 | Seasonal Labor Costs (\$) | 69,857 | 47,406 |
| 36 | Add Employee Load (Benefits) | 17,464 | 11,851 |
| 37 | Total Labour Costs (\$) | 87,321 | 59,257 |
| 38 | Total Labor Unit Costs (\$/m³) | 1.79 | 1.71 |
| 39 | Operation Costs | | |
| 40 | Fuel cost (\$/hr) | 21.00 | 23.00 |
| 41 | Oil/Lube Cost (\$/hr) | 2.10 | 2.30 |
| 42 | Fuel & Lube Cost (\$/m ³) | 0.06 | 0.03 |
| 43 | Repair & Maintenance Costs (\$/year) | 38,400 | |
| 44 | Repair & Maintenance Costs (\$/m ³) | 0.461 | |
| 45 | Total Operation Costs (Season) | 57,423 | 44,634 |
| 46 | Total Operation Unit Costs (\$/m³) | 1.18 | 1.29 |
| 47 | Total Equipment Unit Costs (seasonal) (\$/m³) | 4.21 | 4.25 |
| 48 | Number of Equipments | 14 | 37 |
| 49 | Prodcutivity (m ³ /Pmh) ¹ | 34.79 | 34.79 |
| 50 | Availability (%) | 0.70 | 0.70 |
| 51 | Productivity (m ³ /Smh) | 24.35 | 24.35 |
| 52 | ¹ obtained from contractor | | |