

## Drag Builder Optimises Payloads

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### Introduction

A recent Liro study showed the importance of optimising drag volume in yarder operations (Visser et al., 1999). Consistently hooking on small drags is inefficient. Hooking on overweight drags will overload the system and can decrease productivity.

The optimal drag size is as large as possible without overloading the system. Such drags are achieved through selecting a better combination of butt and top pieces. Each individual piece volume should be estimated so both overloading and under-loading can be avoided. Unless a breakerout has scaling experience, it will be difficult to estimate the volume. This is especially so in the cutover, where only part of the stem may be visible.

### Drag Builder

A tool was designed, built and tested to help train breakerouts to estimate stem volume. The Drag Builder is held across the butt of a stem and the clear markings indicate half tonne volume increments (Figure 1).

The tool is a three-piece telescoping rod made from plastic. It is light weight and easily attached to the breakerout's belt when not in use.

The markings on the Drag Builder are determined from mensuration data held at *Forest Research* for a specific forest area. Based on an average LED - stem volume equation, the Drag Builder aims at an average accuracy of  $\pm 20\%$ . A recent test using independent LED and stem volume data for the Lake Taupo Forest indicated an accuracy of  $\pm 19\%$  (n=100).

The Drag Builder is available from Liro Forestry Solutions at a cost of \$100 (+ GST) for LIRA members.



Figure 1 - Drag Builder

### Field Trial

An experienced breakerout was asked to estimate the volume of 20 stems. Without the use of the Drag Builder, stem volumes were overestimated on average by 0.4 tonnes (32% error). After two days using the Drag Builder intermittently, the same test was repeated. This time, the breakerout underestimated stem volume by only 0.1 tonne (12% error). In this case, the Drag Builder improved the volume estimation and would have helped avoid overweight drags.

### Reference

Visser, R., S. McMahon, T. Evanson and W. Palmer. (1999) : Optimising Cable Yarder Productivity. Liro Report 24(16).



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