



LET'S TALK TRUCKING: WEIGHTS AND LOADING METHODS¹

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Weighing loads of timber in the woods is not new—on-board scales have been around for 30 years. In-woods platform scales are much younger, around 10 years old. Both allow the logger to monitor the weight of individual trucks before they leave the job site. Both offer similar advantages. In-woods platform scales are stand-alone units that are usually located at the loader. A digital readout of the weight of tandem axles can be transmitted to the loader either by a hard wire connection or by radio signal. On-board scales consist of three components: load cells, cabling, and an indicator. The load cells are located on the tractor and trailer at load-bearing points and through deflection measure the amount of weight on a truck. The cabling feeds an in-cab indicator allowing the driver to monitor exact weight. On-board scales offer the following advantages (Talbot, 1999):

- 1) Eliminating overweight fines,
- 2) Maximizing the legal payload,
- 3) Reducing maintenance costs by hauling loads a vehicle was designed for, and
- 4) Increasing safety because overweight loads may increase braking distance.

During the trucking study, truckers were asked whether their load had been weighed in the woods. The use of some type of in-woods scaling varied greatly across the regions (*Table 1*).

Table 1. Percent of trucks using some type of in-woods scaling.

Region	% Usage
NC	60
SC	0
AL/GA	0
MS	39
LA/TX	55

For the individual locations where in-woods scales were found, the gross weight of the trucks was compared for scale and no-scale use (*Figure 2* and *Table 2*). Loads that were weighed in the woods

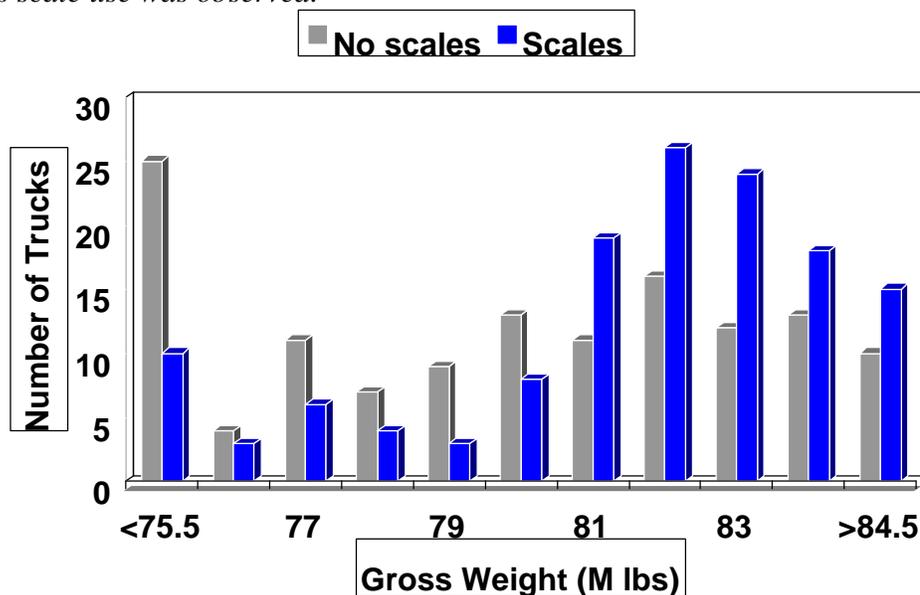
¹ This is the second in a series of five articles written from research conducted at Auburn University during 2004 on ways to improve the productivity, efficiency, safety and costs of the trucking operation associated with logging. For more information on this research study, please contact Tom Gallagher at tgallagher@auburn.edu. The research was funded by the Wood Supply Research Institute (WSRI). For more information on WSRI, contact Jim Fendig at fendig@bellsouth.net.

generally netted more payload than those not weighed. Also, reduced variation in weight minimized the number of light loads, while also reducing the number of heavier loads that may be subject to fines for being overloaded.

Table 2. Average weight and standard deviation by state where scales were in use. North Carolina has an 80,000 pound legal limit; Mississippi and Texas allow 84,000.

State	Scales		No Scales	
	Average	St Dev.	Average	St Dev.
Mississippi	83,154	3,665	82,151	7,212
North Carolina	80,633	3,257	79,670	4,261
Texas	84,029	3,883	80,507	4,477

Figure 1. Gross weight of trucks using scales versus trucks not using scales from locations where some in-woods scale use was observed.



At the follow-up seminars, when loggers were asked why they did not use scales, most indicated they either did not see the benefit or could not integrate them into their operation. Some had tried scales, but following breakdown did not get them repaired. Others believed the sites they worked on were too wet for platform scales. Some loggers used all contract trucking and couldn't get their truckers to install scales. Loggers who did adopt scales were generally positive about their use, though some suggested that mills influenced their buying decision, especially in instances where a mill had a procurement purchase policy of not paying for wood loaded over a certain weight limit. Lastly, loggers indicated the likelihood of being caught overloaded and the potential amount of the fine also had an affect on whether in-woods scales were in use.

Loading Methodology

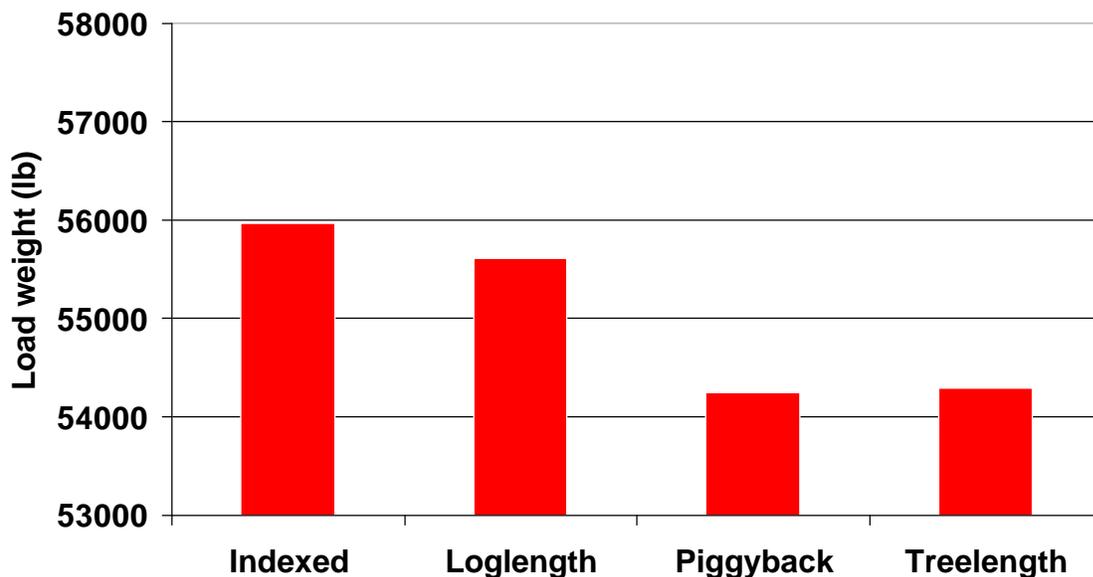
Reaching a total legal load with treelength material may be difficult in some wood types (mostly plantation thinnings) with typical loading practices. To reach the maximum legal load, other loading methods may have to be used, such as indexing (treelength material loaded mixing butt to tops) and

piggyback (a partial load of log length material is put on the back bunk first before treelength material is loaded onto the entire trailer).

Several loading methods were observed: (1) treelength – with all trees aligned in the same direction; (2) log length – with material cut in 14 – 20 foot lengths; (3) indexed – with treelength material loaded mixing butt to tops; and (4) piggyback – where a partial load of log length material was put on the back bunk first before treelength material was loaded onto the entire trailer.

Figure 2 shows the net weight for the four methods of loading at the only mill in our study that allowed all four types of loading. Sawtimber loads were not included because they generally will reach a legal load limit before they run out of room on the trailer. Also, sawmills tend to dictate how wood is delivered (treelength versus log length) and prefer butts be aligned on one end because of merchandizing in the mill.

Figure 2. Net weight per truck for different methods of loading pulpwood. The data for this chart was generated from one mill, because that was the only location that allowed indexing.



Log length loads generally reach the legal limit, because the loader operator can completely fill both bunks with wood. Short treelength or trees with excessive taper do not affect this method because they are bucked up and loaded as necessary. The trucks hauling piggyback are able to get more wood on a load, but the few trucks we sampled did not give a clear indication of the advantage to this method. Indexing, however, resulted in a 1700-lb. increase over standard treelength loads. Indexing wood was found to be acceptable at only one mill that we sampled.

The total weight allowed on a truck was found to vary from state to state across the South. If a logger bought an overload permit, it allowed him to haul heavier loads on state highways. Each state set their own variances. *Table 3* indicates the total weight a truck can carry. We found different perspectives on this issue. While most loggers would welcome an opportunity to load more weight, several industry personnel were less than enthusiastic to put heavy trucks over the road due to safety concerns. Yet a new initiative, developed by a committee for the transportation safety board, has recommended new regulations that may allow for additional weights. In a 2002 report (Transportation Research Board, 2002), a committee is proposing to change the current maximum load of 80,000 lbs. to one determined

by the number of axles. The more axles, the more weight allowed (up to a maximum). What the committee learned was there are so many exemptions out there, many trucks are already hauling higher amounts. And the trucks without exemptions are avoiding the Interstate system (the safest and most efficient routes) to avoid detection. Adoption of these new regulations should improve the system for all trucking entities.

Table 3. Total load weight limits found in several states across the South.

Practical Limits (lbs.)	State
80,000	NC, SC, GA
84,000	MS, TX
86,600	LA
88,000	AL

Recommendations

Ensuring that a truck is fully loaded with the legal limit before going to the mill is important to maximizing efficiency and also for avoiding the cost of overweight fines. Some type of in-woods scaling (either on-board or platform scales) will assist the loader operator in knowing when the legal limit has been reached. Attaining the fully loaded limit may be difficult in some operations (plantation first thinnings), but some loggers have opted to cut wood into random lengths to alleviate this problem. This decision further supports in-woods scaling as log length wood can easily be overloaded.

Indexing wood was observed to increase the payload for pulpwood loads. Allowing indexing, assuring that enough of the trees cross each other to facilitate unloading without having the load fall apart, will increase load weight by 3%. If wood is being stored on the ground, this should also increase inventory space as the level loads are being stacked.

If new legislation is proposed based on the recommendation from the transportation committee to allow total truck weights to be determined by the number of axles, the logging industry should support these new measures. The most likely scenario seems to be centered around allowing 90,000 lbs. for trucks with six axles. There are still many questions about the impact of the bridge formulas and what roadways would be involved, but these new regulations could improve net weights by 20 percent.