

In 2019, the Fairfield University School of Engineering (CT) conducted an ergonomic impact study entitled, "**Ergonomic Benefits of the Patented LogOX 3-in-1 Forestry MultiTool**" which was peer reviewed and published in the *Journal of Innovative Ideas in Engineering and Technology (JIET)*.

LogOX Study Overview:

Using BIOPAC® Electromyography (EMG) technology to measure muscle activation, Professor Dr. Sriharsha Sundarram and his team found that lifting and moving log rounds with the LogOX® Hauler significantly reduced physical strain, across the major muscle groups involved, when compared to conducting the same movements without the tool. The LogOX Hauler was also shown to reduce the time necessary to perform these movements by 23%.

"Tree care industry workers experience a higher than average percentage of back related injuries, due to the nature of the work involved." Source: Sundarram, Sriharsha S. Ergonomic Benefits of the Patented LogOX 3-in-1 Forestry MultiTool. Journal of Innovative Ideas in Engineering and Technology. <http://bit.ly/JIET> September, 2019.

Impact of Back Injuries on the Workforce

- 75%** Of back related injuries caused by lifting.
- \$12K** Average back injury related claim amount in the tree care industry.
- 20** Average number of work days missed due to a back injury.

Sources: US Bureau of Labor Statistics and ArborMax Insurance data.

Comparison Using a LogOX Hauler

- 93%** Reduction in back strain while lifting a log round.
- 89%** Reduction in quadricep strain while walking with a log.
- 76%** Reduction in bicep strain while lifting a log round.

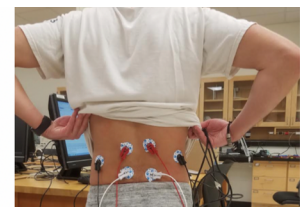
Source: "Ergonomic Benefits of the Patented LogOX 3-in-1 Forestry MultiTool" Refer to EMG data chart below.

Table 1. Summary of EMG data collected from all tests

Activity and Impacted Muscles	(mv) Reading Without Hauler	(mv) Reading With Hauler	Percent (%) Reduction in strain when using the LogOX Hauler
Lifting log correctly – Lower Back (Test 1)	0.02461	0.01122	54
Lifting log incorrectly – Lower Back (Test 2)	0.5760	0.0412	93
Walking with log – Lower back (Test 2)	0.2678	0.0309	88
Walking with log – Quadriceps (Test 2)	0.1854	0.0206	89
Lifting correctly – Biceps (Test 3)	0.0031	0.00163	47
Lifting incorrectly – Bicep (Test 3)	0.0067	0.00163	76



(a)



(b)

Fig. 2. (a) Location of placement of active electrodes to obtain EMG data and (b) Electrodes affixed to gather data from left and right lower back.