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TOP > Available Issues > Table of Contents > Abstract

[PDF (437K)] [References]

An Application of the Lateral Impact Vibration Method to the Genetic Improvement of Heartwood Moisture Content in *Cryptomeria japonica*

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Abstract: The lateral impact vibration method is a non-destructive and high through-put method to estimate heartwood moisture content (MC) in living trees. We applied this method to an investigation of 37 clones of *Cryptomeria japonica* (in total over 1000 trees) in a clonal test stand. With two measurements in 2000 and 2001, the repeatability of this method was very high for the fundamental frequency (f) of vibration of the stem resonated by lateral impact. The value of $1/f$ could be shown to be a function of stem diameter (d). The regression lines differed between clones, and the relationship between d and $1/f$ characterized each clone. Fifteen clones (in total 103 trees) from this test stand were harvested and the MC of the trees was measured. Although $1/df$ could predict MC, the precision of the prediction was not good enough. However, the rank of the clonal means of $1/df$ was almost identical to the rank of the clonal means of MC. It is concluded that the lateral impact vibration method is suitable for the ranking of clones, and therefore for selecting clones, and that this method is applicable and useful for genetic improvement of MC in *C. japonica*.

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