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## AMOUNT AND STRUCTURE OF TREE DAMAGE WHEN USING CUT-TO-LENGTH SYSTEM

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### Abstract

The research was conducted in a spruce stand with disseminated beech and larch trees from the Carpathian Mountains, where thinning operations had taken place. The CTL (Cut-To-Length) system was applied by using harvester and forwarder. The research was aimed at determining the amount of damage to trees, identifying the damage types, their frequency, extent, form and distribution at the level of trees and at the level of the entire stand. Thus, 7.5 % of remaining trees were damaged with the amount of damage depending on the following factors: species, the season when the thinning operations are conducted, harvesting intensity, slope trail, terrain configuration, mechanization level and work organization. Moderate damage prevailed, the damaged trees presenting: bark removal 50%, gouged wounds 43%, and bark abrasion 7%. Most of the damage (65%) was situated at a height below 1 meter, 67% of these being located on trees situated at a distance of 4 meters at most, from the harvesting-forwarding trails centerline. The average area of wounds was 144 cm<sup>2</sup> in the case of bark removal and 277 cm<sup>2</sup> in the case of gouged wounds. Wounds which affected more than 20% of the stem circumference accounted for 13% in the case of bark removal and for 7% in the case of gouged wounds. The results obtained emphasize certain aspects corresponding to the work conditions and the harvesting system applied in spruce stands from the slope terrains where thinning operations have been conducted.

*Key words:* cut – to – length, damage, forest operations, spruce stand, thinning

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