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THE EFFECTS OF TREE SPECIES ON REDUCTION OF THE RATE OF NOISE POLLUTION AT THE EDGE OF HYRCANIAN FOREST ROADS

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Abstract

Plants have an effective role in reducing noise pollution. The aim of this study was to evaluate the impact of broad-leaved and coniferous species on reducing noise pollution according to the distance from the sound source and the tree species type. For this purpose, 25 plots for coniferous species and 25 plots for the broadleaved species was selected. The decibel-meter (Casella Enhances CEL-630) and the trumpet (FIAMM) of machine were used to measure the sound level. Results indicated that the tree at the edge of the forest roads causes to decrease noise pollution. As, there was a significant difference between the distance of 300 meter as compared with the distances of 20 meter and 100 meter for the broadleaved species ($P < 0.05$). We also found an inverse relationship between frequency of broadleaved and coniferous trees and the rate of sound level ($R^2 = 0.94$ for coniferous; $R^2 = 0.89$ for hardwood). In plots consist of broadleaved species, the sound level at the distances of 20, 100 and 300 meter have been reduced 10.6, 14.5 and 19.4 dB, respectively. This difference with considering these distances was respectively 10.4, 14.3 and 16.8 dB for coniferous species. It is suggested that the species with low H:D ratio (Height of tree: DBH) and wide crown used to decrease noise pollution. The coniferous species which is grown dense can be used to provide aesthetic quality and increase number of stories.

Key words: distance, grown dense, H:D ratio, noise pollution, sound level, species type

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