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Carbon Binding of Different Provenances of Douglas fir (*Pseudotsuga menziesii* Mirb. Franco)

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Abstract: Forest tree species are very important in terms of carbon sequestration. Trees store 50% to 75% of the carbon they take up from the atmosphere in their wood, and the rest is released back into the atmosphere during respiration. Douglas fir is forest tree species native to North America, but shown successful growth and high productivity and quality in Europe. Douglas-fir is also considered as a species with high carbon sequestration, with the yearly average carbon storage of 46,46 kg CO_2/year and for this reason it is increasingly popular as a tree for planting. This research aims to select the best provenances of Douglas fir for carbon sequestration in the provenance test in Bosnia and Herzegovina. Material for this research were Douglas fir trees in provenance test in Bosnia and Herzegovina, locality Batalovo brdo near Sarajevo. The provenance test was established in 1966. by planting 2+2-year-old seedlings, and included 5 provenances from Washington, Oregon and Canada, and from altitudes of 150-900 m above the sea. Heights and diameter at breast height of 52-year-old trees were measured, and volumes of trees were calculated. The results showed that the lowest average volume had provenance from the altitude of 900 m, 83-3.0 (0.7313 m^3), and the highest provenance from 300 m, 65-1,0 (1.3410 m^3). If there are 625 trees per ha, provenance 83-3,0 would produce 457 m^3/ha, and provenance 65-1,0 838 m^3/ha, which indicates differences in carbon sequestration. The obtained results can be used in selection of provenance for using in introduction of Douglas fir in Bosnia and Herzegovina.

Keywords: Douglas fir, Provenances, Carbon sequestration.