

THE INFLUENCE OF THE SKIDDING DISTANCE ON THE VALUE OF DAMAGE DONE TO THE SURFACE SOIL LAYER IN THE COURSE OF TIMBER HARVESTING IN PINE THINNINGS

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Abstract: *The requirement to apply those timber harvesting technologies which are the least damaging to the environment ought to be put into the management practice of the State Forests as a priority. In recent years, a number of research and implementation tasks have been undertaken in this respect. Studies conducted for several years in the Department of Forest and Wood Utilization, Agricultural University of Cracow and concerning the timber harvesting technology which uses the winch powered by the chain saw engine [Sowa and Stańczykiewicz 2003, 2005] have shown that, with respect to its environmental impact, this technology is competitive as compared to the one based on horse skidding. The present study consisted in determination and comparison of the size of damage done to the surface soil layer in the course of horse skidding and skidding by means of the MultiFKS winch, and determination of the relation between the skidding distance and the amount of soil damage in the two technologies. The scope of the work was limited to late thinning in a pine stand. The results show that the horse skidding technology caused greater soil damage: on average $U_g = 2,10$; max $U_g = 14,8$. The technology using the winch resulted in a lower value of damage (on average $U_g = 1,28$; max $U_g = 10,0$). Statistical analysis shows that there is no significant correlation between the U_g index and the distance in horse skidding ($r = -0,24$, $p = 0,177$) whereas skidding by means of the winch revealed a high, statistically significant correlation ($r = -0,7$, $p = 0,000$). The values of the U_g soil damage indexes in the technology using the winch showed significant differentiation depending on the distance from the skidding trail: the highest values were obtained close to the skidding trail while the lowest ones were in the area most distant from it.*