Transilvania University of Brasov
FACULTY OF SILVICULTURE AND FOREST ENGINEERING

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Book of abstracts

Transilvania University of Brasov
FACULTY OF SILVICULTURE AND FOREST ENGINEERING

Forest engineering 54

Oral presentations 54

Lukas STOPFER: *Blockchain technology in forest supply chains* 55

Gianni PICCHI, Carla NATI: *Open air woodchip storage and spray coating: a study case* 56

Antonio ZUMBO, Stanimir STOILOV, Iliya NENOV, George ANGELOV, Angelo MAMMOLITI, Andrea R. PROTO: *Comparison of three types of skidders: time consumption and production costs* 57

Rodolfo PICCHIO, Bruno FEMIA, Francesco LATTERINI, Rachele VENANZI: *Assessment of the sustainability of a forest yard carried out with high level of mechanization in mixed chestnut coppices* 58

Rachele VENANZI, Linda RUGGIERO, Francesco LATTERINI, Rodolfo PICCHIO: *Analysis of soil disturbances in a oak coppice, due to forest operations carried out with advanced mechanization* 59

Gabriel Osei FORKUO, Stelian Alexandru BORZ: *Development and evaluation of automated postural classification models in forest operations using deep learning-based computer vision* 60

Mirella ELIAS, Stelian Alexandru BORZ: *Tracing the timber from forest to the mill: an application of the SURF algorithm to fingerprint truckloads based on photographs taken at their ends* 61

Ana Alexandra REYES ROBALINO, Stelian Alexandru BORZ: *Learning curves, forest operators of mechanised harvesting systems and simulators: a systematic review* 62

Laura Susana LLERENA CRUZ, Stelian Alexandru BORZ: *Assessing sustainability in forest operations: a systematic review* 63

Stelian Alexandru BORZ, Eugen IORDACHE, Marina Viorela MARCU: *Postural risk assessment in wood measurement: a follow-up study to explore new measurement options and to check the repeatability of outcomes when using digital options* 64

Raffaele SPINELLI, Natascia MAGAGNOTTI, Giulio COSOLA, Banjamin ENGLER, Stefan LEITNER, Renato VIDONI: *Fuel consumption and time use in alpine cable yarder operations* 65

Natascia MAGAGNOTTI, Raffaele SPINELLI: *First trial of a prototype chain-flail delimber on a short-rotation poplar plantation* 66

Poster presentations 67

Leon Costan URSA: *The real cost of forest resources conservation: The case of the Rodna Mountains National Park* 68

Marius CURCA, Amelia BUCULEI, Ștefan LECA, Carmen IACOBAN: *25 years monitoring of atmospheric deposition in the Rarau Mountains (Eastern Romanian Carpathians)* 69

Alexandra STEFAN (ISPRAVNIC), Răzvan Vasile CÂMPU, Gheorghe STEFAN, Radu VLAD: *Size-growth relationship for Norway spruce (Picea abies (L.) H. Karst) silver fir (Abies alba Mill.) and beech (Fagus sylvatica L.) stands from the north of the Eastern Carpathians* 70

Transilvania University of Brasov
FACULTY OF SILVICULTURE AND FOREST ENGINEERING

Gheorghe ŞTEFAN, Răzvan Vasile CÂMPU, Alexandra ŞTEFAN, Radu VLAD, Any Mary PETRIȚAN: *Structure of some Norway spruce (Picea abies L.) stands in the north of the Eastern Carpathians* 71

Andrei Ioan APĂFĂIAN, Raul RADU, Vlad CRIŞAN, Diana VASILE: *Recycled materials. A successful revival of wooden products for a circular bioeconomy* 72

Tomi KAAKKURIVAARA, Nopparat KAAKKURIVAARA, Stelian Alexandru BORZ: *Extracting small-sized eucalyptus logs by farm tractors equipped with backhoe grapples: a simulation of cycle time, productivity and efficiency in Thai short-rotation forestry* 73

Alexandru OLARU-ZAFIESCU, Alice Elena TESILEANU, Ionuț MITOFAN, Elena Camelia MUȘAT: *Assessment of wood quality at spruce trees affected by a forest fire* 74

Alice Elena TESILEANU, Alexandru OLARU-ZAFIESCU, Ionuț MITOFAN, Elena Camelia MUȘAT: *The impact of forest fires on trees development and wood quality, using non-destructive and destructive methods* 75

Tolga OZTURK, Ebru BILICI, Muhittin INAN, Batin YER: *Investigation of changes in air quality levels during debarking operations* 76

Ebru BILICI, Robert F. KEEF, Timothy E. LINK, Furkan CAKMAK: *Planning Stream Protection Zone Harvesting with a Lidar-Based Single Tree Inventory (STI) and Developing GIS Tool* 77

Salvatore F. PAPANDREA, Maria Francesca CATALDO, Giuseppe BOMBINO, Pasquale A. MARZILIANO, Andrea R. PROTO: *Evaluation of post-fire salvage logging in the Mediterranean Area* 78

Geomatics, informatics, modelling and statistics 79

Oral presentations 79

Liviu-Stelian BEGU, Andreea-Oana BEGU: *Econometric model for the forest sector* 80

Levente DIMÉN, Alexandra DREGHICI: *Urban forestry- safety assessment* 81

Mihnea CĂȚEANU: *Ground surface retrieval in forest areas using satellite LiDAR data* 82

Sergiu-Constantin FLOREA, Mihai-Daniel NIȚĂ: *Evaluating the precision and reliability of tree measurement data from different scanner devices* 83

Mohamed-Islam KESKES, Mihai-Daniel NIȚĂ: *Developing an AI tool for monitoring forest systems* 84

Ioana Alexandra NICOLAE, Mihai Daniel NIȚĂ: *Analysis of the influence of historical canopy disturbances on the hydrological regime in the Dâmbovița Valley watershed, upstream of Pecineagu reservoir* 85

Jorge DIAZ SUAREZ, Ioan CIORNEI, Mihai Daniel NIȚĂ: *Mapping forest height in Cuba using remote sensing* 86

Mohamed AYA, Petru Tudor STĂNCIOIU, Mihai Daniel NIȚĂ: *Influence of Forest Structure on Leaf Area Index (LAI) in Postavaru Mountain using Hemispheric Photography and Terrestrial LiDAR* 87

Transilvania University of Brasov
FACULTY OF SILVICULTURE AND FOREST ENGINEERING

Investigation of changes in air quality levels during debarking operations

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Abstract: *Debarking of coniferous timber is an essential process in the wood production industry in Türkiye. One of the most time-consuming stages in the production of coniferous trees is debarking of the logs. Operating a chainsaw for debarking releases air pollutants such as bark residues, dust, sawdust, and fuel materials. This situation greatly diminishes air quality, posing a serious health risk for workers who breathe in the polluted air daily. Additionally, it negatively impacts the surrounding environment, leading to broader ecological consequences and the degradation of natural habitats. This study aims to investigate the impact of the debarking process on worker health and environmental impacts in black pine (Pinus nigra A.) plantations in Sarıyer region. The air pollution parameters $PM_{2.5}$, PM_{10}, CO_2 and HCHO levels during the debarking process were measured using a Temtop M2000 air quality meter. The results showed that when comparing these values to standard air quality metrics, it's clear that the peak values of $PM_{2.5}$, PM_{10}, and CO_2 result in a "Very Unhealthy" environment. The average values for all three are classified as "Unhealthy" for $PM_{2.5}$, and "Moderate" for PM_{10} and CO_2. The study results emphasize that the log debarking process is associated with bark volume, CO_2 release and $PM_{2.5}$ levels. Workers in harvesting must use maximum protective equipment, especially respirators. Raising awareness and training forest workers on protective equipment use is also crucial. These findings can help develop effective policies for worker health and environmental air quality.*

Keywords: *timber harvesting, debarking, air quality, Temtop M2000.*