

Tree Cutters' Hard Wood Dust and Exhaust Gases Exposure A Case Study in Tuscany

Enrico Marchi, Martina Cambi, Francesco Neri*, Fabio Fabiano, Gianfranco Sciarra
DEISTAF - University of Florence
Via S. Bonaventura, 13 – 50145, Florence, Italy
francesco.neri@unifi.it

Abstract:

The European Union proclaimed in 1999, wood dust as carcinogenic basing on the classification of the International Agency for Research on Cancer (IARC) issued in 1995. In 2002 the Tuscany Region promoted the first study on the wood manufacturing operators' hard wood dust exposure. The dust limits were established at the values of 5 mg/m³, but the first surveys did not take into consideration the manual forest cut operations. In 2010 according to the new legislation on work and safety, (Legislative decree 81/2008) the Tuscany Region promoted a new research project on the evaluation of the forest operators' hard wood dust and exhausts gases exposure in chainsaw cutting operation and in chipping operation, using a standardized survey methodology. Project partners are: CNR Ivalsa (National Council for research – Tree and Timber Institute), focusing on chipping operation; the University of Florence (DEISTAF Agricultural and Forestry Engineering Dept.) for chainsaw operation and the Public Safety Laboratory of the Provincial Health and Safety Agencies n°7 of Siena province in Tuscany for the samples analysis. The primary aim of this project is to correlate the chainsaw working time with the dust polluting amounts measured in different forest sites and working operations (coppice clear cut, softwood thinnings or sanitary cut) and to highlight the operational aspects and the operator behaviours that may maximize the exposure to the polluting agents. The mass concentration of respirable particles and total dust at the workplace was determined by the method of personal collectors connected to different air pumps. The surveys were focused on the collection of: the hard wood dusts, the polycyclic aromatic hydrocarbons (PAHs) and the values of benzene, toluene, etilbenzene and xilene present in the exhaust gases. One of the most important result expected is the reduction of the polluting agents (benzene, toluene, etilbenzene and xilene) concentration using the special fuels (alkylate petrol) for chainsaws in comparison to the normal fuels usually adopted. Concerning the hard wood dusts concentration analysis, an high influence of the survey season (winter or summer), the operators' working methods and the tree species it is also expected.

Keywords: wood dust, chainsaw, safety, exhaust gases