Available online at www.sciencedirect.com

ScienceDirect

Procedia - Social and Behavioral Sciences 223 (2016) 435 – 441

Procedia Social and Behavioral Sciences

2nd International Symposium "NEW METROPOLITAN PERSPECTIVES" - Strategic planning, spatial planning, economic programs and decision support tools, through the implementation of Horizon/Europe2020. ISTH2020, Reggio Calabria (Italy), 18-20 May 2016

A survey on occupational injuries in works on trees in Italy

A.R.Proto [a], F. Mazzocchi [b,*], F. Cossio [b], L. Bortolini [c], S. Pascuzzi [d], L. Caruso [e], M. Diano [f] G. Zimbalatti [a]

[a]*Department of AGRARIA, Mediterranean University of Reggio Calabria, Feo di Vito 89122, Reggio Calabria, Italy*
[b]*Tuscia University, Department of Agricultural and Forestry scieNcEs (DAFNE), Viterbo, Italy*
[c]*Padova University, Department of Land, Environment, Agriculture and Forestry, Padua, Italy*
[d]*Universita degli Studi di Bari, Department of Agricultural and Environmental Science, Bari, Italy*
[e] *Universita degli Studi di Catania, Department of Agricultural Engineering, Catania, Italy*
[f]*INAIL Dip. Medicina, Epidiemiologia, Igiene del lavoro e Ambientale, Italy*

Abstract

The aim of this work is to know how many injuries occur during climbing and pruning to arborists and other operators who work on trees, the type of accidents and why they happen. This study was carried out during the period from 2002 to 2012 using INFORMO, the database of INAIL (National Organization for the Labour Insurance) that contains a list of serious and fatal injuries occurred to workers and counted by its Prevention Service. From this list only accidents related to operators who was working on trees, at least 2 meters above a stable ground without using elevating work platform, have been extracted. In these workplaces, operators should work safely using tree-climbing techniques with ropes and harness. The scope of the study was to understand the common triggers of injuries, if there are technical problems that can be solved, or other problems that can be addressed to decrease the number of accidents and their severity.

Peer-review under responsibility of the organizing committee of ISTH2020

Keywords: arboriculture; tree-climbing; pruning; safety; health.

1. Introduction

The presence of trees within the cities, including avenues, private gardens, etc., is now recognized as a necessity for the general well-being of individuals and societies. A number of benefits can be listed, such as the carbon storage (Nowak & Crane, 2002; Di Giacinto, Colantoni, Cecchini, Monarca, Moscetti & Massantini, 2012), the reduction of air pollution (Yang, Mcbride, Zhou & Sun, 2005); (Nowak, Crane & Stevens, 2006), the mitigation of the heat island effect (Solecki, Rosenzweig, Parshall, Pope, Clark, Cox & Wiencke, 2005); (Onishi, Cao, Ito, Shi & Imura, 2010), the providing of habitat for wildlife (Adams, 1994, Marucci, Pagnello, Monarca, Colantoni & Biondi, 2012; Marucci, Monarca, Cecchini, Colantoni & Cappuccini, 2013); (George & Zack, 2001), the reduction of storm water runoff and flooding (Bartens, Day, Harris, Dove & Wynn, 2008); (Xiao & McPherson, 2002), not counting the high landscape value (Jim & Chen, 2010). These benefits, however, entail the burden of maintenance that includes:

- a proper assessment of the needs of the trees (airspace, radical);
- control of diseases (fungal, bacterial, and insect infestations);
- pruning.

Peer-review under responsibility of the organizing committee of ISTH2020
doi:10.1016/j.sbspro.2016.05.266

*Corresponding author. Tel.: +39.0761.357357.
E-mail address: mazzocchi@unitus.it

The latter, which allows reaching the best compromise between the tree growth and the traffic's needs and safety along with the space limitations, must be done by green areas management professionals, because of their knowing about plants biology and the reactions of various types of pruning to the tree, depending on its species and age (Cecchini, Colantoni, Massantini, & Monarca, 2010). Besides the green professional must know the operating procedures to perform the pruning, in order to work efficiently and safely (Bortolini, Cividino, Gubiani, Cecchini, Delfanti & Colantoni, 2016; Colantoni, Marucci, Monarca, Pagnello, Cecchini e Bedini, 2012; Boubaker, Colantoni, Allegrini, Longo, Di Giacinto, Monarca & Cecchini, 2012). In this work, accidents occurred in workplaces during work on trees have been investigated, especially during pruning of tall trees or other operations on trees that provide movements of the operator above two meters in height from a stable work plan, without the aid of a lifting platform. Such technical work in canopy is called tree-climbing, for its characteristic safely climbing into the canopy of the tree using a positioning system with ropes and harnesses (Perry, 1978). This method is used all those times when pruning or consolidation of branches is required but the target tree cannot be reach with an elevation work platform. Thanks to this survey is meant to understand what the most common injuries in this work are and, consequently, what are the measures to limit the occurrence or diminish the severity of the consequences.

2. Materials and methods

The data subject of this paper was extracted from the database INFORMO, made by INAIL (National Organization for the Labour Insurance), available on the web at http://www.ispesl.it/getinf/informo/. Inside the database, we found over 3800 dynamics to accident, which took place between 2002 and 2012, analyzed by the prevention services with a shared analysis model. It is important to highlight that INAIL is the only insurance institution for workers in Italy and its owned data are complete and reliable because all companies are obliged to declare injuries and workers' number (Fabiano, Curro & Pastorino, 2004). In the "Archive of cases" of the database, you can search for areas of interest using the filters available; you can also make a free search with keywords using a search engine. With the said method, all injuries related to the word "tree" have been searched, and the search engine generated a list of 166 cases, which were analyzed individually to find the correspondence with the type of work investigated. Among these, 21 cases were eligible to the survey, because about pruning or felling of trees working over two meters' height from a stable ground without the use of platforms. The INFORMO database classifies accidents with an alphanumeric code and each event is associated with a brief description to detail the accident (data on the place of the incident, the injured, the company and the consequences), a record card to show the details of the injury factor and, eventually, other cards if, together with the determinant, there are one or more modulators factors that have influenced the development of the accident.

3. Results

From the data obtained in this analysis, looking at the modal data of each category, the profile of the standard worker more susceptible to injury was come out. The number of accidents detected about this work method covers the 12.65% of the total of serious injury and/or death occurred during all operations on trees. Of those analyzed, 9.5% has electrocution as a key, while the remaining 90.5% fall from height. Although in the used archive are merged both fatalities and those serious, all injuries related to this type of work were fatal.

3.1 Accident's generic characteristics

Considering the period examined, from 2002 to 2012, the average number of injuries was 1.9 per year, ranging from 1 to 3 per year (fig. 1).