Sample for Abstract

**Health and Safety Risks in Hop-Picking Activities: An Analysis of the State of the Art**

Giovanni Matranga1(🖂), Niccolò Pampuro1, Federica Caffaro2,   
Lucia Vigoroso1, and Eugenio Cavallo1

1 Institute of Sciences and Technologies for Sustainable Energy and Mobility (STEMS), National Research Council of Italy (CNR), Strada delle cacce, 73,  
10135 Turin, Italy

2 Department of Education, University of Roma Tre, Via del Castro Pretorio, 20 – 00185 Rome, Italy

*Corresponding author* 🖂 *e-mail address*

**Abstract**. In the last decade, hop cultivation has seen greater interest in small and medium-sized farms due to the rising importance of craft beer micro-breweries requiring local raw materials. However, high investments are needed for mechanized harvesters. Small-scale farms cannot face these costs; thus, manual harvesting of hop cones is frequently adopted. The study investigated the risks for the health and safety of operators during manual and mechanized harvesting, also examining musculoskeletal disorders the workers can incur. A literature review and secondary data analysis investigated risk factors associated with the manual and mechanized harvesting process. Furthermore, the operator’s workload related to the hop cones picking time was analyzed based on international standards.

The results showed that operators face several critical issues during the different tasks of the manual harvesting of hops. Some of the operations are carried out at height with the risk of falling and assuming bad postures that can pose risks to the operator’s health. Furthermore, the study points out major health concerns for the workers because of the repetitiveness of the operations they have to carry out. The mechanization of harvesting involves a significant increase in efficiency by reducing the number of operators involved. This results in an improvement in operators’ health conditions. However, the harvesting equipment can represent a safety risk for the operators because of their interaction with the moving parts of the machinery.

**Keywords:** Hop, Mechanized harvesting, Manual picking, Musculoskeletal disorders, Occupational safety