**Hazelnut harvesting machines: recent advances and new trends**

**Riccardo Alemanno, Pierluigi Rossi, Gianmarco Rigon\*, Massimo Cecchini, Danilo Monarca**

DAFNE Department - Tuscia University, Viterbo, Italy

+39 0761 357357 - gianmarco.rigon@unitus.it

**Keywords.** Agricultural machinery, hazelnut, harvester, agriculture 4.0.

***Abstract.*** In the last decade, world hazelnut production has increased by about 25%. Italy is the world's second largest hazelnut producer after Turkey, the total area invested in our country is just over 92,300 hectares, marking an increase of over 20,000 hectares in the last ten years. The coriliculture production remains very concentrated, with 80% of the invested area located in only three regions, Piedmont (29%), Lazio (28%) and Campania (24%) and 19% in four other regions, including Sicily. There is, however, an increasing trend also in other regions: among these, Tuscany and Veneto stand out.

In order to meet a growing demand from the market, the development of newer harvesting machines in the hazelnut sector became mandatory. Italy is one of the main producers of hazelnut harvesting machinery. The need to adapt to different production areas, to business dimension which significantly vary among regions has resulted in a larger market offers with diversified solutions for both small and bigger farmers. The leading companies in the hazelnut harvesting mechanization sector have been therefore identified and their main products have been examined.

The purpose of the paper is to describe the innovations and technological advances implemented on these machines in recent years. All these improvements mainly aimed to increase their productivity and to improve safety and comfort for the operators.

Consequently, a taxonomy of the systems adopted for the hazelnut harvesting operations is presented, differentiated according to the type of machines used (tractor mounted mechanical harvesters, trailed vacuum harvesters, self-propelled vacuum and mechanical harvesters). The research also aims to present early applications of agriculture 4.0 technologies in hazelnut mechanized harvesting, with a specific focus on possible applications of precision agriculture technologies.