

## Side-Row Continuous Canopy Shaking Harvester for Intensive Olive Orchards

J.O. Peça<sup>a</sup>, A.B. Dias<sup>b</sup> and A. Pinheiro<sup>c</sup>  
Instituto de Ciências Agrárias e Ambientais Mediterrânicas (ICAAM)  
Departamento de Engenharia Rural da Universidade de Évora  
Núcleo da Mitra, Apartado 94, 7002-554 Évora  
Portugal

V. Cardoso  
Victor Cardoso Lda.  
Zona Industrial de Castelo Branco, lote 111, Apartado 1088, 6001-901 Castelo Branco  
Portugal

D. Reynolds de Souza  
Engenheiro Mecânico, Consultor do Projecto  
Portugal

J.M. Falcão  
Torre das Figueiras Sociedade Agrícola Lda.  
Herdade da Torre das Figueiras, Apartado 23, 7450-999 Monforte  
Portugal

**Keywords:** high density olive groves, olive harvesting, canopy shaking

### Abstract

Olive producing countries invested largely in high density groves varying from 200 to 550 trees/ha for which no efficient totally mechanized harvesting methodology and technology is available. Continuous canopy shaking is the obvious approach, not only increasing working capacity but also overcoming the problem of scarce and expensive labour. The equipment available today follows the over-the-row concept for which tree growth is a limitation. Large over-the-row olive harvesters, mainly of South American and Australian design, are too heavy and expensive, hardly suitable to the difficult wet soil conditions encountered in the Mediterranean countries. The side-row concept is the obvious alternative. Furthermore it tends to be simpler and less expensive, meaning lower purchase running costs. In 2009 a research project was set to develop such technology. The equipment comprises two symmetrical harvesters that follow a tree row one at each side. Each harvester is a trailed type structure towed by a farm tractor which also drives the harvest hydraulic power pack. A second operator controls the harvest through electro-hydraulic controls. A vibratory rotor with flexible rods detaches fruits which are collected at a catching platform. Fruits are conveyed to a temporary storage bag which is hydraulically lowered to the ground when full. The row side of the harvester is bordered along the edge by flexible synthetic interface with the tree trunk. The prototype was given a two harvesting campaign trial and the basic concept is now set. This paper gives an account of the project and describes the technical challenges for the next stage of translating the prototype into a viable product for the market.

### INTRODUCTION

Olive production in the Mediterranean basin is gradually shifting from low density

<sup>a</sup> jmop@uevora.pt

<sup>b</sup> adias@uevora.pt

<sup>c</sup> pinheiro@uevora.pt