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Analysis of factors affecting the mechanical olive harvesting in Guilan province

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Introduction

Olive is one of the most valuable worldwide trees that produces useful products having high nutritional values. It is widely grown in many parts of world. The cost of olives hand picking is estimated to be about two-thirds of the total gross return of olive production. Therefore, various types of olive harvesting machineries were developed in the world.

Guilan Province of Iran is one of the leading regions for olives production in Iran. At the present time, almost all olives produced in Guilan province of Iran are manually harvested. Review of the reports showed that no research was performed to study the factors affecting the development of mechanized olive picking in Guilan Province, Iran. Due to the complexity of using the olive harvest machineries, identifying the factors affecting of their application is essential. Therefore, a Delphi study were conducted to identify and analysis the drivers and barriers for mechanized olive harvest in Guilan province, Iran.

Materials and Methods

This research was conducted using the Delphi technique in Guilan Province, Northern Iran. Delphi technique is a structured process to gather and classify the knowledge of a group of experts. Through consultation with professors and researchers in related institutions, 22 experts from the subsidiary offices of agricultural organization of Guilan Province were selected for the study. In the first round of the study, the participants were asked to answer to two open questions about the driving factors and barriers of mechanical olive harvest in Guilan Province. Nineteen items were found as driving factors and seventeen as barriers for developing the mechanical olive harvesting in Guilan Province. In the second phase of the study, the respondents were asked to answer to the all items written in the form of a five-level Likert scale, and finally, experts of panel were asked to answer to the top 10 items of driving factors and barriers in percent form. The results were analyzed using SPSS computer software and arranged in various tables.

Results and Discussion

Based on the findings of last phase of the Delphi study, ‘modification of olive groves and applying the technical fundamentals to the orchards’, agreed upon by 98.15% of the participants, was identified as the first driving priority to mechanize the olive harvest in Guilan Province. In this regard, pruning olive trees is the first modification practice which should be applied to the old olive groves of the region. Olive cultivar is the other parameter affecting on the performance of olive harvest machinery. Therefore, this parameter also must be considered in construction of new groves or renovate the old olive gardens.

‘Special support for related researches to construct and optimize the olive harvesting machinery’ was also as the second driving factor to develop mechanized olive harvesting in Guilan Province. In this regard, design and fabricate the new machinery based on the local conditions is a matter of great importance.

The findings of last phase of the Delphi study also indicated that ‘the slope of most olive growing plots’, agreed upon by 95.62% of the respondents was identified as the first barrier for mechanical olive harvesting in Guilan Province. Thus, research on all the technical aspects of hand-held harvesting machines, including hand-held shakers should take priority.

Lack or shortcoming of planning for the development of the olive harvest mechanization was also as the second barrier to develop mechanized olive harvesting in Guilan Province. Therefore, codifying a regional macro-plan to develop mechanized olive harvesting in Guilan Province must be considered among the important

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Conclusions

The results of this study showed that many factors affect the mechanical harvesting of olives in Guilan province which modification of olive groves, special support for related researches to construct and optimize the olive harvesting machinery are among the most important driving factors. Therefore, to develop the mechanical olive harvester, developing the applied strategies to support the olive growers, modification of foreign machinery, and design and fabricate of new olives harvest machinery are essential in Guilan province, Iran.

Keywords: Agricultural mechanization, Barriers, Delphi, Drivers, Olives