

12 Abstract

The paper presents the production conditions of selected 50 organic farms located in southern Poland.

The main objective of the work was to analyze the determinants of production processes carried out on selected organic farms, and then to evaluate the efficiency of modernization of technical equipment and the effects of management with particular emphasis on farms with additional orchard production.

The purpose of the study was carried out in a three-stage research: field, empirical and model studies. For the purpose of learning about production conditions, a one-year field survey was carried out on 50 organic farms located in southern Poland. For these farms, the indicators used to assess modernization efficiency and farming effects were calculated.

Relationships between factors characterizing production conditions and indicators describing efficiency of modernization of technical equipment and farming effects were determined from statistical analysis using the hyperlift method. This method made it possible to group farms with ranges of independent variables that have a positive or negative recommendation on the evaluated indicator on the farm.

Based on the analysis, among the selected 27 independent variables that characterize production conditions, it was possible to extract those that have a positive recommendation and significantly affect the efficiency of technical equipment modernization and management effects.

Optimization using the k nearest neighbor method with the Manhattan metric for selected dependent variables, which were: the index of profitability of objectified labor inputs, agricultural income, labor productivity, the index of technical armament, the index of productivity of technical equipment, the index of renewal of the machinery park, the index of reinvestment of the farm allowed us to present recommended values of independent variables in the selected farms from the studied groups.

Unit multivariate optimization on selected farms indicated independent variables that were recommended and significantly affect the efficiency of modernization of technical equipment and farming effects. This is evidenced by the high quality parameters of the models, i.e. correlation and determination coefficients.