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DYNAMICS OF ORGANIC AGRICULTURE IN ROMANIA - COMPARATIVE ANALYSIS FOR 2010-2022 PERIOD

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Abstract: The study analyzed the dynamics of economic operators and the areas cultivated in ecological systems in Romania, in the 2010–2022 period. For the analysis, data from the MADR records were considered. The total crops area in the ecological system registered an increasing trend, with some inflections and linear growth in the period 2016-2022. Within the total crops area, the area of grain, pasture and hay crops showed a similar pattern of variation. The leguminous and protein crops showed a fluctuating variation of the surfaces, with a maximum in 2018. Tuberculiferous and root crops recorded the maximum value of the cultivated area in 2012, followed by a decreasing trend. Industrial crops registered an increasing trend throughout the study period. Permanent crops (orchards, vines, fruit trees, nuts) recorded a growth rate in the period 2010-2019, with a stabilization of the surfaces in the period 2019-2022. Different models were obtained to describe the variation of the elements analyzed during the study period.

Introduction

Conventional agriculture ensures high crop yields, but associated with it, a series of sustainability and durability effects have been registered [11]. As an alternative to conventional agriculture, the author estimates the perspective of ecological agriculture, with ecological and socio-economic advantages over time. Ecological farms generate lower yields, compared to conventional farms, but they present a series of advantages in that they provide better food from a nutritional point of view, reduce residues, integrate secondary products (circular economy), and are generally more friendly to the environment [19], [17].

Material and method

The study analyzed the variation of some parameters specific to organic agriculture during the period 2010 - 2022 in Romania. The annual data recorded by MADR [24] were analyzed for the study.

Parameters related to ecological agriculture were considered, according to the recorded data: operators certified in ecological agriculture (OCEA), total area in ecologic agriculture (TAEA), total grains (TGS), dry and proteinaceous legumes for seeds production (DPLS), tuberculiferous and root plants (TRP), industrial crops (IC), green harvested plants (GHP), other crops on arable land (OCAL), fresh vegetables including melons and strawberries (FVMS), permanent crops orchards, vines, fruit bushes, nuts (PCOV), permanent pasture and hay crops (PPHC), uncultivated land (UL). To facilitate the analyzes and graphical representations in the present study, abbreviations were used for the parameters, presented in parentheses.

• Results and discussions

The data related to ecological agriculture, which include operators, categories of crops and areas for the considered study period, 2010 - 2022, were analyzed for a descriptive statistical characterization. Moderate variability was recorded in the case of total grains (ha), TGS (CV=26.017). The highest level of variability was recorded in the case of other crops in arable land (ha), OCAL (CV=111.533). This can express the high diversity of crop plants (OCAL category), the attempt of operators in organic agriculture in Romania to cultivate different crop plants, in order to better valorize the products obtained on the market. In the case of the other parameters, operators certified in ecological agriculture (OCEA), total area in ecological agriculture (TAEA), and crop categories, high variability was recorded, as follows: CV = 30.244 in the case of OCEA; CV = 41.589 in the case of TAEA; CV = 49.445 in the case of DPLS; CV = 42.240 in the case of TRP; CV = 36.023 in the case of IC; CV = 86.809 in the case of GHP; CV = 32.892 in the case of FVMS; CV = 50.962 in the case of PCOV; CV = 60.359 in the case of PPHC; CV = 29.273 in the case of UL. Multiparameter analysis (PCA) was used to obtain the distribution diagram by crop categories in the ecological system (biplot parameters) and years during the study period. The crop categories (abbreviation) codes in the diagram) were taken into account, with the related areas during the study period. PC1 explained 65.752% of variance, and PC2 explained 12.79% of variance.



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PC1 (65.752% variance)

PCA diagram with the representation of crop categories (in code format) in relation to the years during the analysis period

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Ranking scaling representation of crop categories in the ecological system, MADR database, Romania, period 2010 – 2022

Conclusions

From the analysis of the EA indicators registered in Romania, period 2010 - 2022, a differentiated variation was found in relation to the indicator and the study interval.

For most crop categories, the areas recorded a decrease in the period 2010-2016, and an increasing trend in the period 2017-2022.

Adequate statistical indicators described the behavior of the analyzed AE indicators, with different levels of variability. Mathematical models described the



