

STUDIES ON THE INFLUENCE OF THE LEVEL OF FINANCIAL SUPPORT ON THE TREND OF AREA CULTIVATED IN ORGANIC FARMING SYSTEM

Veronica LUNGU¹, Daniel Valeriu ULIU¹, Marius VLADU²

¹University of Agronomic Sciences and Veterinary Medicine of Bucharest, 59 Marasti Blvd, 011464, Bucharest, Romania, Phone: +40799743938, +40766287579, E-mails: lunguveronica103@gmail.com, daniel_uliu@icloud.com

²University of Craiova, Faculty of Agronomy, Department of Agricultural and Forestry Technology, 19 "Libertății" Street, Craiova 200583, Dolj County, Romania, Phone: +40744870085, E-mail: mariusvladu@yahoo.fr

Corresponding author: daniel_uliu@icloud.com

Abstract

Organic farming promotes extensive agricultural practices, providing environmental public goods and responding to society's demand for the use of environmentally friendly agricultural practices, but also to increased consumer demand for organic products. Organic agriculture contributes to mitigating the greenhouse effect and global warming, through the ability to sequester carbon in the soil. Many practices used in organic agriculture (for example, incorporation of plant residues into the soil, use of green crops and crop rotation, the ability of vegetables and legumes to fix nitrogen in the soil), increase the return of carbon to the soil, increase productivity and promote carbon storage. Organic agriculture is a dynamic sector in Romania that has seen an upward evolution in recent years. Through the study carried out, we aimed to highlight the evolution of agriculture in an ecological system with the help of compensatory payments granted by the European Union, in the South - West Oltenia Region of Romania, in the period 2019 - 2021. It was found that the surface of 18,420 hectares in 2019 increased to 36,241 hectares in 2021, and until 2024 it is expected that the trend of the area cultivated in the ecological system also to grow.

Key words: organic farming, compensatory payments, sustainable agriculture, agricultural policy

INTRODUCTION

The practices specific to ecological agriculture contribute to protecting biodiversity, maintaining soil fertility and functionality, reducing water resource pollution (by eliminating pesticide runoff, strict manure management) and improving water management (improving soil structure, reducing the risk and severity of floods and drought, in the context of climate change), reducing carbon dioxide emissions and ensuring animal welfare conditions (reduced livestock density). In addition to their environmental benefits, they can serve as a basis for increasing the added value of agricultural production and developing economic activities at the local level [5].

One of the future options is ecological agriculture, which emphasizes sustainability, human health, biological conservation and combines scientific knowledge and modern

technology with traditional agricultural practices based on thousands of years of agriculture [3]. In our country, ecological agriculture represents a sector of interest, being one of the main segments of sustainable development in the rural environment. Ecological agriculture can lead to: maintaining fertility, increasing biological diversity for plants and animals, recycling residues from agricultural production, obtaining clean products, reducing environmental pollution, protecting health, creating friendly relations between productive activities and environmental conservation [11]. The transition to organic farming is becoming a necessity in a sustainable development society. Based on the circumstances predetermining Romania's potential to develop organic agriculture, the challenge of convergence in organic agriculture remains a relevant issue for Romania in the medium and long term [8].

Ecological agriculture is a sector of great perspective for Romania, due to the fact that it enjoys suitable conditions for the development of such an agricultural system, fertile soils and low level of pollution of the rural landscape, compared to economically developed countries, where technologies are used large-scale super-intensive agriculture, based largely on chemical fertilizers and pesticides [9]. The European Union's Common Agricultural Policy (CAP) has not stopped the loss of farmland biodiversity. The post-2023 CAP has a new "Green Architecture", including the new "Eco-scheme" tool [7]. Environmental and climate expectations are likely to increase in the next EU Common Agricultural Policy cycle; therefore, the topic of agriculture for soil conservation is justified to be a priority and requires preparation for the development of appropriate interventions in the National CAP Strategic Plan [2]. European agriculture, and implicitly that of Romania, must respond to a new challenge, that of reducing the amounts of pesticides used, according to the demands of the Farm to Fork strategy, a component of the Green Deal, which requires that 25% of the agricultural area be dedicated to ecological agriculture and a 50% reduction in the use of pesticides, an aspect we will detail in this scientific communication [4]. The concept of sustainable development appeared in an attempt to reconcile agri-food production with measures to conserve non-renewable resources, but also an attempt to protect the environment, and in this process the farmer has an important role considering the effects that specific activities have. so much on the environment. Because of this, more and more actors involved in this process, from farmers to consumers, but also politicians have begun to pay more attention to ecological agriculture, as an advantageous means of reconciliation between man and nature [10]. In PNDR 2014-2020, Measure 11 - "Organic agriculture" seeks to encourage the conversion to ecological agriculture methods, as well as the maintenance of these methods after the end of the conversion period. The budget for this new measure in Romania is 36.1 million euros, including both European funds and the

national contribution, according to data published by the Ministry of Agriculture, which are informative. The selection criteria and the amounts that the beneficiaries will receive will be established after the European Commission approves the new PNDR 2020. The support is given to farmers as a fixed amount per surface unit (ha) and represents compensation for the loss of income and the additional costs incurred by beneficiaries who enter into commitments regarding the conversion or maintenance of organic farming practices [6].

MATERIALS AND METHODS

The purpose of this study is to analyze the impact of environmental and climate measures that are applied through the new agricultural policies and strategies in the context of climate change, in Romania, through the National Rural Development Program, in the period 2019-2021.

The situation of payment requests was extracted from the database of the general monitoring of the Agency for Payments and Intervention in Agriculture.

All payment requests were analyzed regarding the number of beneficiaries, the related areas, as well as their payment amount. A detailed analysis was carried out on the specific measure M11 – Organic Farming. A statistical analysis of the data was carried out regarding the forecasts of cultivated areas related to Measure M11, in the period 2022-2024, in the South-West Oltenia Region, applying the formula below:

$$Y(x) = y(1) + \frac{x-x(1)}{x(2)-x(1)} * [y(2) - y(1)] \dots \dots (1)$$

where:

- $[x(1), y(1)]$ and $[x(2), y(2)]$ are two endpoints of the known interval;
- x - the value of the point to be extrapolated.

To highlight the influence between the cultivated area related to Measure M11 (Organic Agriculture) and the total area declared APIA, the following formulas are used:

-The correlation coefficient:

$$r = \frac{\sum(x_i - \bar{x})(y_i - \bar{y})}{\sqrt{(\sum(x_i - \bar{x})^2)(\sum(y_i - \bar{y})^2)}} \dots\dots\dots(2)$$

where:

x and y are the means for the samples, AVERAGE (array 1) and AVERAGE (array 2)

-Linear and polynomial function of the second degree:

Linear – linear model (simple regression):

$$y = a + bx \dots\dots\dots(3)$$

Polynomial function:

$$y = a_0 + a_1x^1 + a_2x^2 + \dots + a_nx^n \dots\dots\dots(4)$$

RESULTS AND DISCUSSIONS

In Table 1, it is noted that the number of hectares declared at APIA, in the South-West Oltenia Region, increased every year, in the analyzed period 2019 - 2021. In 2019, a total of 1,005,050 hectares were declared, being represented by 105,245 payment requests. In 2020, the surface increased to 1,031,657, and the number of financing applications increased by 121,638. In the last analyzed year, the area registered at APIA increased to the value of 1,054,436 hectares, and the number of applications increased to 120,456. It is noted that the number of applications, as well as the number of hectares, were constantly increasing.

Table 1. The situation of APIA payment requests in the South - West Oltenia Region

County	2019		2020		2021	
	No. Payment requests	Ha	No. Payment requests	Ha	No. Payment requests	Ha
Dolj	27,011	413,595.80	34,650	421,814.02	34,618	426,840.02
Gorj	16,109	65,763.00	17,693	69,890.50	17,238	70,934.14
Mehedinți	18,721	132,870.00	21,193	138,954.49	21,226	145,228.98
Olt	26,082	330,711.02	29,129	332,804.15	28,995	340,377.40
Vâlcea	17,322	62,110.58	18,973	68,194.09	18,379	71,055.51
Total	105,245	1,005,050	121,638	1,031,657	120,456	1,054,436

Source: Own calculation based on APIA data [1].

Table 2. Cultivated area related to Measure M11 – Organic Agriculture

Year	County (ha)					Total Oltenia (ha)	Value (euro)
	Dolj	Gorj	Mehedinți	Olt	Vâlcea		
2019	2,670.64	10,369.97	1,697.83	2,164.06	1,517.74	18,420	1,948,706
2020	4,564.05	11,759.05	2,281.96	3,837.75	3,263.11	25,706	3,100,914
2021	7,186.96	14,301.74	2,542.96	6,731.75	5,477.93	36,241	4,740,233
Total	14,421.65	36,430.76	6,522.75	12,733.56	10,258.78	80,367.50	9,789,853

Source: Own calculation based on APIA data [1].

Table 2 shows that in the South - West Oltenia Region, during the analyzed period, 2019 - 2021, the declared area belonging to Measure 11 - Ecological Agriculture increased, in 2019 the declared area was 18,420 hectares (1,948,706 euros), in In 2020 the declared area increased to 25,706 hectares

(3,100,914 euros), and in 2021 it increased to 36,241 hectares (4,740,233 euros). Regarding the forecasts regarding the cultivated areas related to Measure M11 – Organic Farming, it is observed that at the level of the South - West Oltenia Region, it is expected that the areas declared with this

Measure, in the following years, 2022 - 2024, (Figure 1).
 will increase in the counties of this area

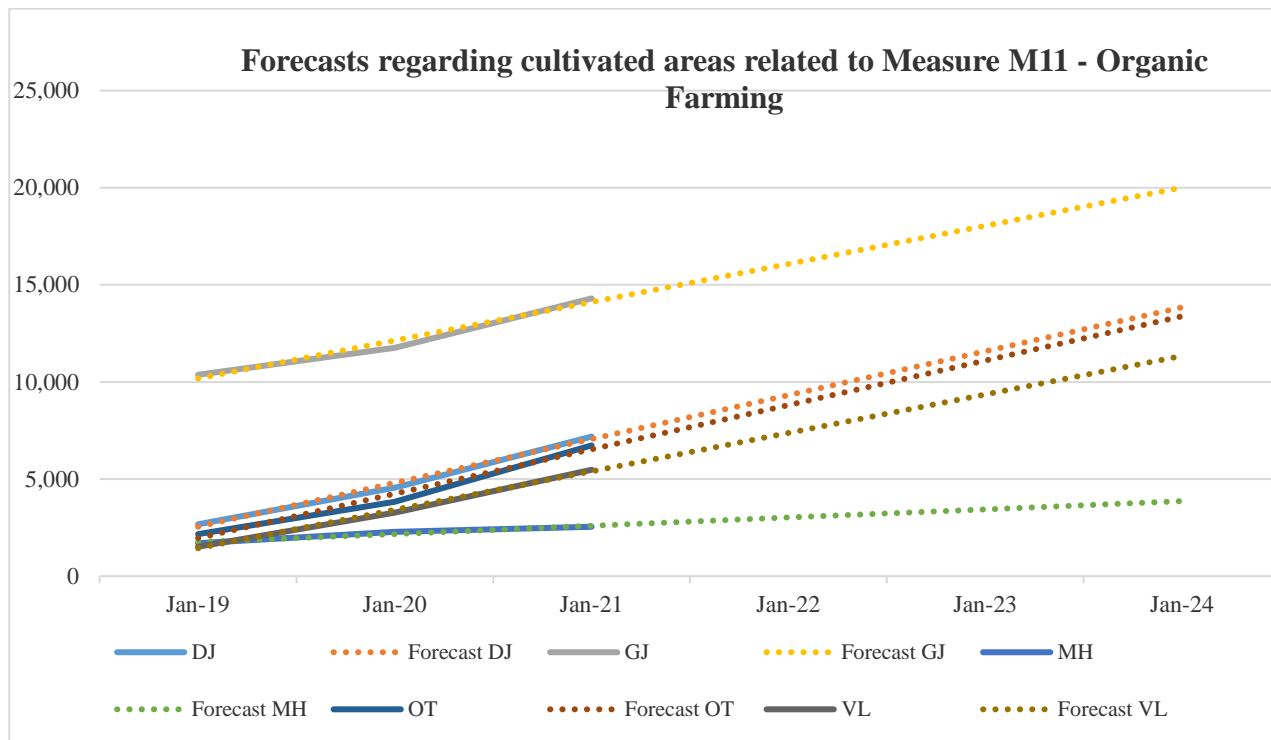


Fig. 1. Forecasts regarding cultivated areas related to Measure M11 – Organic Farming, 2022-2024
 Source: Own construction.

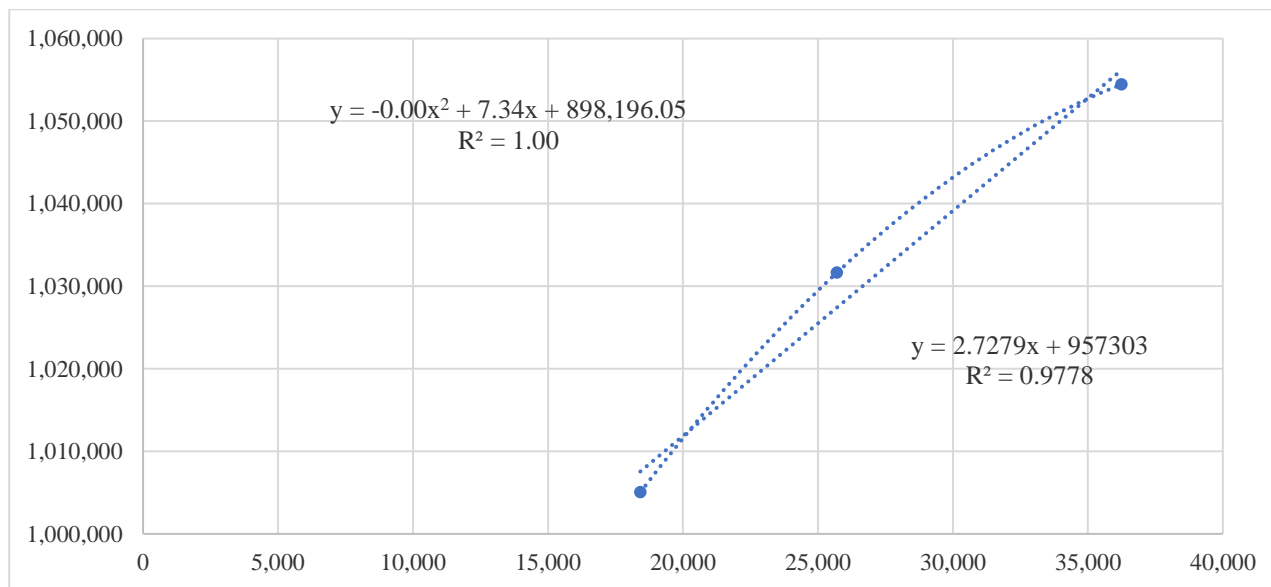


Fig. 2. Correlation between the area related to measure M11 and the total area declared at APIA in the South - West Oltenia Region (2019 - 2021)
 Source: Own construction.

The correlation of the values between the area related to measure M11 and the total area declared at APIA in the South - West Oltenia Region, resulted in a strong direct correlation ($r=0.98$). This is due to the fact that in this analyzed period, 2019 – 2021, both values of

the analyzed surfaces have increased. Also, the value of the polynomial function of the second degree ($y = -0.00x^2 + 7.34x + 898,196.05$) $R^2=1$ indicates the same thing (Figure 2).

CONCLUSIONS

The situation of payment requests registered at the Agency for Payments and Intervention in Agriculture, in the Southwest Oltenia Development Region, between 2019 and 2021, was increasing, where in 2019 105,245 payment requests were registered with 1,005,050 hectares, and in 2021, 120,456 payment requests were registered with 1,054,436 hectares.

The cultivated areas related to Measure M11 – Organic Farming, in the Southwest Oltenia Development Region, in the period 2019 - 2021, increased from the surface of 18,420 hectares in 2019, to the value of 36,241 hectares in 2021. During this entire analyzed period, 2019 – 2021, Gorj County has the largest area registered in the ecological system with 36,430.76 hectares, and Mehedinți County has the smallest area registered in the ecological system with 6,522.75 hectares. Regarding the interest in this measure, according to the forecasts for the years 2022 - 2024, it is estimated that it will increase in the following years, in the counties of the South West Oltenia region.

The increased interest for Measure 11, and from the direct correlation between the area related to Measure 11 and the total area declared at APIA, as the total areas declared at APIA increase, the areas cultivated in the ecological system also increase (correlation coefficient = 0.98).

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