

# Agro-Economic Dynamics of Wheat Production in Prahova County (2003-2023)

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## INTRODUCTION

The selection of wheat as the focus of this study is grounded in its strategic relevance for Romania’s agricultural sector, where it remains essential for food security and maintains a substantial share in national production and trade. Prahova County was chosen due to its diverse agro-economic conditions, favorable climate, and well-developed infrastructure, which together provide an appropriate setting for analyzing long-term trends in wheat cultivation. As a representative agricultural region, Prahova offers a meaningful context for examining the evolution of cultivated areas and production dynamics. Thus, the combined choice of wheat and Prahova County enables a coherent investigation of a key crop within a region with significant agricultural potential, facilitating the identification of structural opportunities and constraints over the 2003–2023 period.

## METHODOLOGY

The study was conducted using a quantitative methodology, based on official data from the National Institute of Statistics for the period 2003–2023, extracted from the Tempo Online platform. The analysis focused on the evolution of the cultivated area (hectares), gross production (tons), and yield per hectare (tons/ha) in Prahova County. In this context, the working hypothesis is as follows:

- The cultivated area and wheat production in Prahova County between 2003 and 2023 have evolved in a manner significantly influenced by economic, climatic, and political factors, and the statistical analysis will demonstrate the adaptability of the agricultural sector, with notable improvements in productivity per hectare, despite fluctuations in cultivated area and total production.
- The data were processed using descriptive statistical methods and comparative analyses to identify significant trends and fluctuations.

## RESULTS AND DISCUSSION

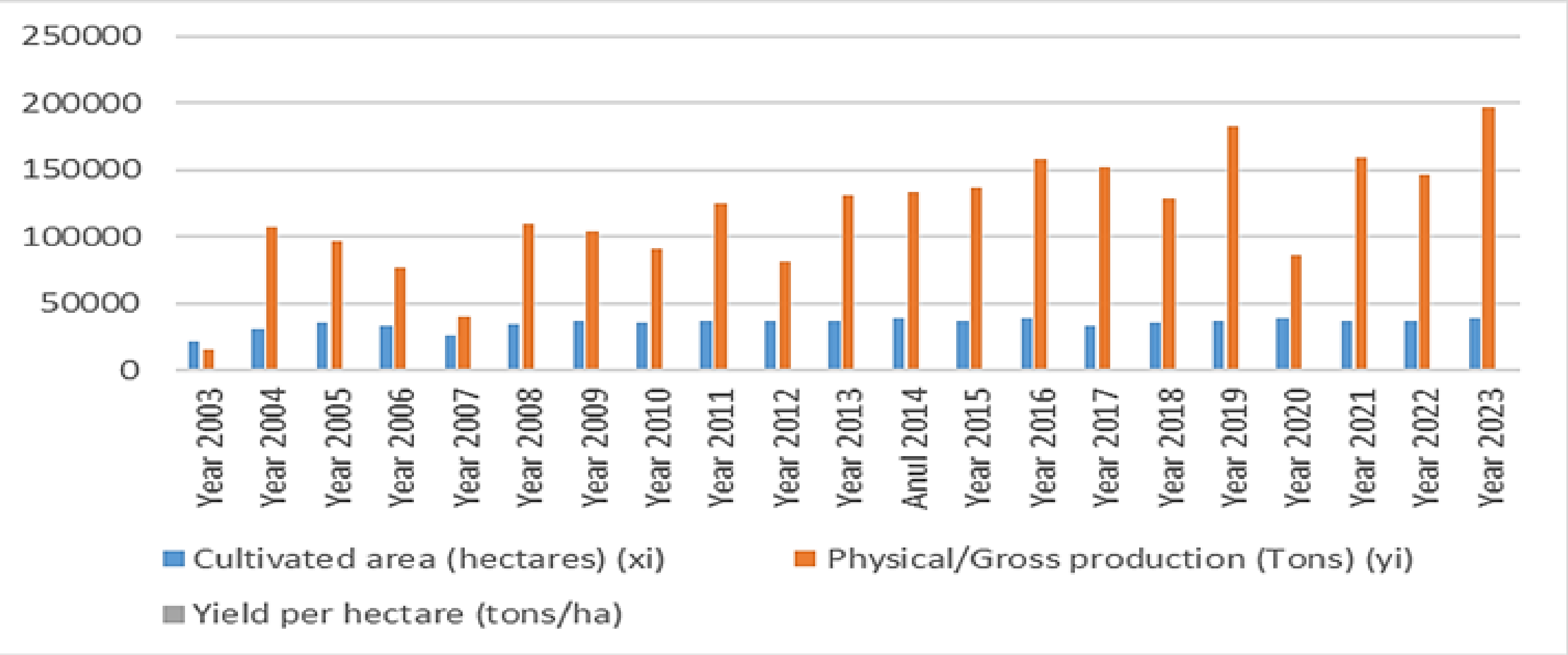
According to available data, the cultivated area with wheat in Prahova County has shown notable variations over the two decades analyzed. In the 2000s, the area dedicated to this crop experienced a decline, influenced by factors such as the restructuring of agricultural holdings and changes in national agricultural policies. However, starting in 2010, a trend of stabilization and even a slight in-crease in the cultivated area was observed, due to the implementation of support programs for farmers and investments in modern cultivation technologies.

Fig. 1 highlights the dynamics of the wheat cultivation area and production in Prahova County over a period of 20 years. It can be observed that the cultivated area has experienced moderate fluctuations, without extreme variations from one year to another, reflecting a certain structural stability in the local agricultural sector. However, wheat production has shown more pronounced variations, primarily influenced by annual climatic conditions and the level of technological inputs used.

Years with low yields, such as 2003 and 2007, coincide with periods of severe drought, while high yields, such as in 2023, are associated with favorable weather conditions and the modernization of agricultural practices. The general trends suggest that, although the cultivated area remained relatively constant, the in-crease in productivity per hectare has been the key factor in improving agricultural performance in the county.

These developments highlight the importance of technological adaptation and agricultural policy support for the stability and progress of the local cereal sector.

Fig. 1. Level of wheat cultivation area and production in Prahova County between 2003-2023  
Source: own conceptualization based on data from Tempo.ro, accessed on 03.02.2025.



The productivity per hectare was influenced by several factors, including the precipitation regime, the use of fertilizers and high-quality seeds, as well as the level of mechanization. Investments in modern agricultural technologies and the adaptation of cultivation practices to climatic conditions are essential for im-proving agricultural yields.

For a more thorough interpretation of the data available on the Tempo.ro plat-form, I used the EViews 12 program, enabling a detailed analysis of the evolution of the studied indicators.

Fig. 2. Presentation of Descriptive Statistics and Discussion of Distribution Normality for Production in Tons  
Source: EViews 12

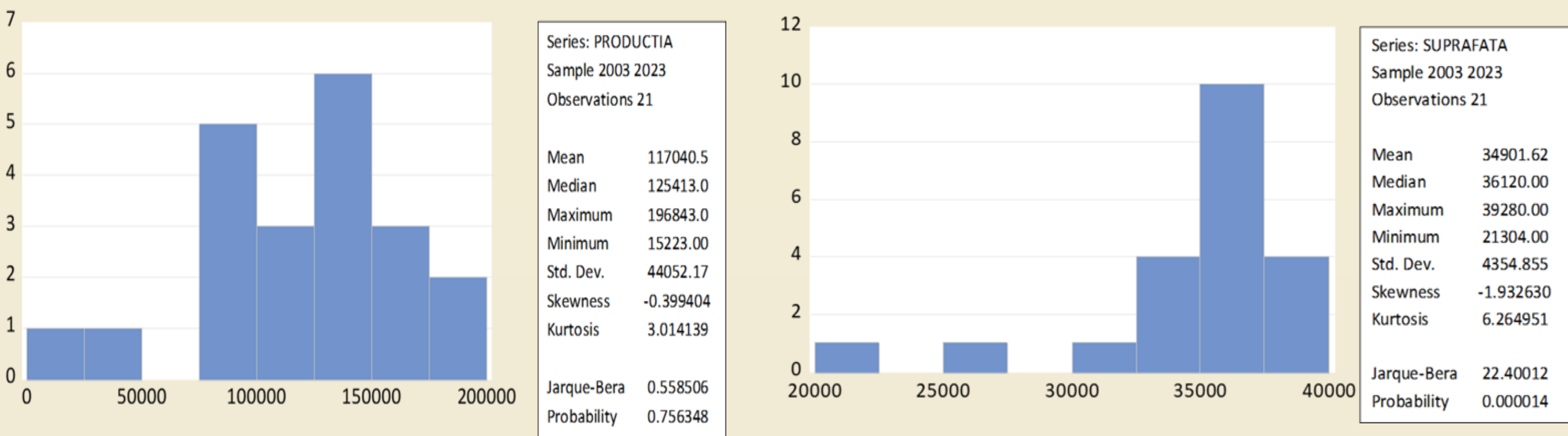


Fig. 3. Testing the stationarity of the model variables – a hypothesis that must be met for the validity of the model  
Source: EViews 12.

Null Hypothesis: PRODUCTIA has a unit root			
Exogenous: Constant			
Lag Length: 1 (Automatic - based on SIC, maxlag=4)			
	t-Statistic	Prob.*	
Augmented Dickey-Fuller test statistic	-1.180695	0.6601	
Test critical values:	1% level	-3.831511	
	5% level	-3.029970	
	10% level	-2.655194	

\*MacKinnon (1996) one-sided p-values.

Null Hypothesis: SUPRAFATA has a unit root			
Exogenous: Constant			
Lag Length: 0 (Automatic - based on SIC, maxlag=4)			
	t-Statistic	Prob.*	
Augmented Dickey-Fuller test statistic	-4.509594	0.0022	
Test critical values:	1% level	-3.808546	
	5% level	-3.020686	
	10% level	-2.650413	

\*MacKinnon (1996) one-sided p-values.

Fig. 4. Regression Model Results  
Source: EViews 12.

Dependent Variable: D(PRODUCTIA)  
Method: Least Squares  
Date: 04/27/25 Time: 02:32  
Sample (adjusted): 3 21  
Included observations: 19 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
PRODUCTIA(-1)	-0.314696	0.266535	-1.180695	0.2550
D(PRODUCTIA(-1))	-0.460948	0.201099	-2.292147	0.0358
C	45090.56	31792.28	1.418286	0.1753
R-squared	0.443016	Mean dependent var	4710.632	
Adjusted R-squared	0.373393	S.D. dependent var	42996.52	
S.E. of regression	34035.39	Akaike info criterion	23.85213	
Sum squared resid	1.85E+10	Schwarz criterion	24.00125	
Log likelihood	-223.5952	Hannan-Quinn criter.	23.87737	
F-statistic	6.363081	Durbin-Watson stat	2.170523	
Prob(F-statistic)	0.009263			

Dependent Variable: D(SUPRAFATA)

Method: Least Squares

Date: 04/27/25 Time: 02:34

Sample (adjusted): 2 21

Included observations: 20 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
SUPRAFATA(-1)	-0.686660	0.152267	-4.509594	0.0003
C	24714.03	5320.290	4.645242	0.0002
R-squared	0.530473	Mean dependent var	898.8000	
Adjusted R-squared	0.504388	S.D. dependent var	4099.034	
S.E. of regression	2885.708	Akaike info criterion	18.86757	
Sum squared resid	1.50E+08	Schwarz criterion	18.96714	
Log likelihood	-186.6757	Hannan-Quinn criter.	18.88701	
F-statistic	20.33644	Durbin-Watson stat	2.031785	
Prob(F-statistic)	0.000271			

## CONCLUSIONS

The study demonstrates that, despite variations in the wheat cultivated area over time, the consistent increase in yield per hectare reflects notable progress in agricultural practices and resource management. Between 2003 and 2023, the agricultural sector in Prahova County exhibited a strong capacity for adaptation to economic and climatic challenges, with modern technologies, policy support, and market-oriented adjustments contributing to production stability and, at times, growth. Overall, fluctuations in output were mitigated by technological advancements and targeted support measures, highlighting the sector’s resilience. Ensuring long-term sustainability will require continued investments in irrigation systems, modern technologies, and coherent agricultural policies.