STUDY OF WHEAT PRODUCTION AND DERIVED PRODUCTS IN THE NORTH-WEST REGION OF ROMANIA, FOCUSING ON BIHOR COUNTY

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RESEARCH ARTICLE

Abstract

This study analyzes wheat production and its derived products in the north-western region of Romania, with a focus on Bihor County. In recent years, Bihor County has been distinguished by significant wheat yields, with an average production of approximately 6,000 kg/ha in 2021 and 2024, with some plots reaching even 10,000 kg/ha. This performance is attributed to favorable pedoclimatic conditions and the application of modern cultivation techniques and agricultural management. However, wheat quality has varied, recording both high-quality yields and some with lower parameters, influencing its use in baking. The study explores the determining factors of these fluctuations, including agricultural technologies, climatic conditions, and storage infrastructure. Additionally, the economic impact of wheat production on Bihor County is analyzed, considering that a large part of the harvests are destined for export, while local processing remains underdeveloped.

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INTRODUCTION

Agriculture represents a cornerstone of Bihor County's economy, holding a significant share in rural economic activities. Among the main crops, wheat occupies a central place due to constant demand and favorable pedoclimatic conditions. The western region of Romania, especially Bihor County, benefits from a temperate-continental climate, with moderate precipitation and fertile soils, conducive to the development of cereal crops.

Wheat is one of Romania's most important agricultural crops, playing an essential role in the population's diet and in the agricultural economy. In the north-western region of Romania, particularly in Bihor County, wheat occupies significant areas and is a traditional crop, valued both locally and nationally. This paper aims to analyze the evolution of wheat production, identify factors influencing yield, and assess the processing potential into derived products such as flour, bread, and pasta.

Regarding the agricultural characteristics of Bihor, the county is characterized by varied relief, with the predominance of plains in the southern part and low hills in the central-northern area. This geographical profile, along with the dense hydrographic network (Crişul Repede, Crişul Negru), contributes to maintaining adequate humidity for agricultural crops (Popescu & Rusu, 2020). According to the Bihor County Directorate for Agriculture, in the 2023 agricultural year, wheat was cultivated on approximately 45,000 hectares, representing one of the most extensive crops in the region.

In this county, farmers predominantly cultivate winter wheat, with both native and foreign varieties adapted to local climatic conditions. Among the most widespread varieties are: Glosa, Miranda, Izvor (Romanian varieties), as well as Apache or Arlequin (French varieties). The choice of varieties is influenced by drought resistance, yield, and disease tolerance. Native varieties are preferred for their adaptability to local soils, while foreign varieties offer higher production potential under optimal conditions.

Producers in Bihor employ a combination of traditional methods and modern technologies. In recent years, more and more

farms have adopted high-performance machinery for sowing, fertilizing, and harvesting, leading to increased yield per hectare. Additionally, the use of improved wheat varieties adapted to local pedoclimatic conditions has contributed to stabilizing production, even in years with significant climatic variations (Ionescu et al., 2021).

Farmers in Bihor adopt various practices to improve wheat crop productivity. Among these are:

- Soil preparation through plowing and disking in autumn;
- Sowing during the optimal period (October 10–25);
- Fertilization with chemical and natural fertilizers (manure);
- Control of diseases and pests through phytosanitary treatments;
- Mechanized harvesting in July.

A major challenge is the lack of functional irrigation systems, which affects yields in drought years.

It is also important to mention the factors influencing wheat production, the most significant being:

- **Climate**: Annual variations in precipitation directly influence yield. Prolonged droughts during grain formation can significantly reduce production.
- **Soil quality**: Areas with chernozem soils, such as the southern plain of the county, offer optimal conditions for wheat (Mihăilescu, 2019).
- **Agricultural inputs**: Rational fertilization and adequate phytosanitary protection are essential for obtaining a rich and healthy harvest.
- **Land fragmentation**: In some communes, land is fragmented, limiting efficient mechanization (Zaharia, 2020).

MATERIALS AND METHODS

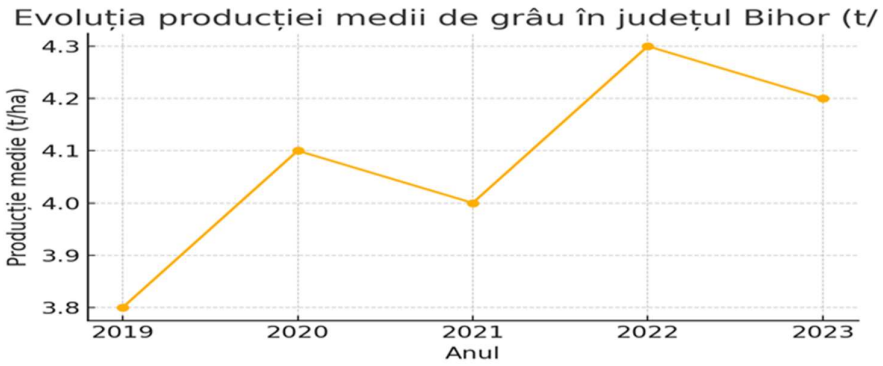
For this study, statistical data on wheat production in Bihor County were collected, including cultivated area, yield per hectare, and harvest quality. Secondary sources, such as reports from the Bihor County Directorate for Agriculture and specialized publications, were also analyzed to assess the impact of agricultural technologies and climatic conditions on wheat production. The methodology includes quantitative analysis of statistical data and qualitative assessment of harvest quality, as well as comparative analysis of production in different areas of the county.

The following research methods were employed:

- Analysis of statistical data published by INS, APIA, and the Bihor Agricultural Directorate;
- Field observations conducted in several farms in Bihor County;
- Semi-structured interviews with 10 local farmers and 3 wheat product processors;
- Analysis of specialized literature on wheat cultivation technologies and food market trends.

RESULTS AND DISCUSSIONS

Regarding production trends, statistical data show an increasing tendency in the average yield per hectare over the last 10 years, from approximately 3,200 kg/ha in 2010 to over 4,500 kg/ha in 2023 (INS, 2024). This evolution is associated with investments in modern technologies as well as better management of natural resources. However, challenges related to climate change and limited access to agricultural financing for small producers may slow this progress.



The analyzed data also show a slight increase in the area cultivated with wheat in Bihor County over the last 5 years, with significant variations in production depending on climatic conditions. The average yield was around 4.2 t/ha, placing the county close to the national average. Limiting factors include the lack of irrigation and price fluctuations.

Farmers interviewed consider that diversifying wheat-based products (artisanal flour, organic bakery products) represents an important opportunity. At the same time, the lack of technical support and market fluctuations remain constant challenges.

Most of the wheat produced in Bihor County is marketed through agricultural cooperatives or directly to local processors. There are several mills that process wheat into flour, part of which is used in artisanal or industrial bakeries. The derived products — bread, pasta, biscuits — reach local markets, supermarkets, and even export channels. The development of short supply chains is supported by European policies, offering farmers greater control over prices and a direct relationship with consumers.

Area Cultivated with Common Wheat in Northwestern Romania

Wheat Yield per Hectare in Northwestern Romania

Data analysis revealed a significant increase in wheat production in Bihor County in recent years, with an average yield of 6,000 kg/ha in 2021 and 6,800 kg/ha in 2024. This performance is due to the application of modern technologies, such as the use of superior quality seeds, appropriate fertilization, and effective control of diseases and pests. However, wheat quality has been influenced by climatic conditions, particularly drought, which negatively affected the qualitative parameters of the harvest.

In some areas, such as Diosig and Cauaceu, yields exceeded 10,000 kg/ha with superior quality. In contrast, other areas like Ciumegiu and Avram Iancu registered lower yields, below 4,000 kg/ha, due to less favorable pedoclimatic conditions.

Regarding wheat processing, Bihor County has adequate infrastructure, with 216 authorized storage facilities totaling a capacity of 781,900 tons. Nevertheless, a large part of the production is destined for export, and local processing remains underdeveloped, which limits the added value of agricultural production.

CONCLUSIONS

The study highlights that Bihor County possesses significant agricultural potential, supported by favorable pedoclimatic conditions and a long-standing tradition of wheat cultivation. However, to fully capitalize on this potential, the implementation of strategic measures is necessary:

- **Investment in Irrigation Infrastructure:** Building and modernizing irrigation systems will enable farmers to better cope with drought conditions and ensure stable, consistent crop yields.
- **Development of Local Processing Industry:** Establishing mills and bakery units will contribute to job

creation and increase the added value of agricultural production within the region.

- **Professional Training for Farmers:** Organizing courses and workshops will assist farmers in adopting modern technologies and improving agricultural practices, enhancing productivity and sustainability.
- **Promotion of Local Products:** Creating regional brands will enhance the appeal and marketability of Bihor's agricultural products on both national and international markets.

By implementing these measures, Bihor County can become a model of sustainable development in Romanian agriculture, contributing to food security and the economic growth of the region.

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