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Study on the evolution of input costs for wheat cultivation for the period 2019-2023

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Abstract: This study examines the evolution of input costs associated with wheat cultivation over the period 2019–2023, focusing on the main categories of production expenses: seeds, fertilizers, pesticides, fuel, mechanized operations, and labor. Based on statistical and economic data collected during this timeframe, the analysis reveals a significant upward trend in total production costs, primarily driven by the increase in energy and fertilizer prices.

• Introduction

During 2019–2020, input costs remained relatively stable, with only minor price fluctuations. In 2021, the post-pandemic economic recovery led to noticeable increases in fuel and fertilizer expenses. The situation escalated in 2022, when the war in Ukraine caused a sharp surge in energy and raw material prices, resulting in a record rise in wheat production costs, estimated at 40–60% above 2019 levels. In 2023, a slight stabilization occurred, although input costs remained high compared to the pre-pandemic average. The findings indicate that the share of fertilizers and fuel in total production costs grew substantially, together accounting for more than 50% of total input expenditures. Additionally, global market volatility affected farm profitability, prompting producers to adopt more efficient and sustainable cultivation practices.

• Material and method

- To understand the types of agriculture findings in Romania, a mixed methods approach was employed, which includes:
- analysis of academic articles, governmental reports, and bank articles to understand historical context and current trends

• Results and discussions

• Fertilizers (N, P, K)

- **2019–2020:** Modest moves; logistics and gas prices still stable overall.
- **2021:** Costs rose as natural gas and ammonia markets tightened; global shipping bottlenecks.
- **2022:** Peak shock. Natural gas spiked, curbing European nitrogen output; trade disruptions increased prices for N, P, and K.
- **2023:** Prices receded from 2022 highs but remained well above 2019–2020 averages.
Takeaway: Fertilizer was the single largest driver of the total cost surge.
- **Fuel & energy 2020:** Lower diesel prices during early pandemic.
- **2021–2022:** Strong rebound; diesel and electricity for irrigation/drying jumped, amplifying variable costs.
- **2023:** Eased but stayed elevated, keeping fieldwork and post-harvest energy bills high.

• Conclusions

From 2019 to 2023, wheat growers navigated a step-change in production costs. The most dramatic move was the fertilizer shock of 2022, compounded by high fuel and machinery expenses. Although 2023 brought partial relief, the overall cost base remained materially above 2019 levels. Farms that combined smarter procurement with efficiency-oriented agronomy fared best. Looking ahead, resilience depends on active input-price management, precision agriculture to lift input productivity, and financial strategies that protect cash flow during future volatility.