



Technical University of Moldova

**ECONOMIC EFFICIENCY AND INVESTMENT
DECISION-MAKING IN MODERN VITICULTURE:
A CASE STUDY OF THE PERGOLA TRELLIS
SYSTEM AT “VIA NOASTRĂ” LLC**

MASTER'S THESIS

Masterand:

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ANNOTATION

This study aims to analyze the economic efficiency and investment requirements of intensive viticulture systems, with a particular focus on the Pergola (Tendone) system. The study has an empirical nature and is developed through a case study of Via Noastra S.R.L., a modern agricultural enterprise located in Semionovca, Stefan Voda, Republic of Moldova.

Viticulture is changing from production focused on volume to production based on quality and export. The increasing demand for higher quality grapes, more advanced technology and greater resistance to weather extremes creates new challenges for the viticulturist and demands more efficient production systems.

The overall purpose of this research is to evaluate whether the high capital invested in such large vineyards can generate consistent economic profits once the plantation reaches productive maturity. The results have been evaluated from both a financial and technical point of view and quantified through CAPEX, OPEX, return on investment and payback period.

The analysis combines qualitative and quantitative data, drawing on international research and on the internal accounting records of Via Noastra S.R.L. for the 2024–2025 period, when the vineyard reached full productive maturity.

The Pergola system proved to be highly productive, with a documented yield of nearly 30 t/ha and a theoretical potential of up to 40 t/ha under ideal conditions, but it remains highly vulnerable to climatic variation, particularly the risk of rainfall during the harvest period, which directly affects fruit quality and the achievable selling price.

The results obtained show that, at full productive maturity, the direct capital investment of 34.59 million MDL generated a net profit of 14.47 million MDL, corresponding to a return on investment of 75.5 percent on a net private basis and a payback period of approximately 1.3 years.

The research has shown that intensive viticulture systems are economically promising in the long run in the Republic of Moldova, and their further development should be directed toward the application of new technologies to mitigate climatic risk factors, such as anti-rain coverings, and toward more rational management of costs and marketing strategies.

Modern viticulture in Moldova is becoming an increasingly capital-intensive activity, making investment decisions more strategic for global market competitiveness.

Keywords: viticulture, table grapes, Pergola system, investment efficiency, CAPEX, return on investment (ROI), climate risk

ADNOTARE

Prezenta teză analizează eficiența economică și procesul decizional investițional în viticultura intensivă modernă, cu accent pe sistemul Pergola (Tendone), prin studiul de caz al companiei Via Noastra S.R.L., întreprindere agricolă modernă situată în satul Semionovca, raionul Stefan Voda, Republica Moldova. Cercetarea evidențiază transformarea sectorului viticol dintr-un model tradițional orientat spre volum într-un model intensiv orientat spre calitate, export și tehnologizare.

Scopul general al cercetării este de a evalua dacă investiția de capital ridicată, specifică unor astfel de plantații de mare amploare, poate genera profituri economice consistente după atingerea maturității productive a plantației. Analiza combină informații calitative și cantitative, bazându-se pe cercetări internaționale și pe datele contabile interne ale Via Noastra S.R.L. pentru perioada 2024–2025, când plantația a atins maturitatea productivă deplină.

Lucrarea examinează relația dintre investițiile realizate în infrastructura viticolă modernă și performanța economică obținută după atingerea maturității productive a plantației. Analiza include evaluarea investițiilor de capital (CAPEX), a costurilor operaționale (OPEX), a veniturilor, profitabilității, productivității pe hectar și a indicatorilor de eficiență investițională, precum rentabilitatea investiției (ROI) și termenul de recuperare.

Rezultatele demonstrează că sistemul Pergola permite obținerea unor producții ridicate și competitive pentru export, de aproape 30 t/ha, cu un potențial teoretic de până la 40 t/ha în condiții ideale, însă rentabilitatea pe termen lung depinde de capacitatea întreprinderii de a menține standardele de calitate în condiții climatice instabile, în special riscul precipitațiilor în perioada recoltării. La maturitate productivă deplină, investiția directă de capital de 34,59 milioane MDL a generat un profit net de 14,47 milioane MDL, ceea ce corespunde unei rentabilități a investiției de 75,5% pe bază netă privată și unui termen de recuperare de aproximativ 1,3 ani.

Studiul evidențiază importanța investițiilor suplimentare în protecție anti-ploaie, digitalizare, infrastructură post-recoltare și eficiență energetică pentru consolidarea rezilienței afacerii în fața riscurilor climatice.

Concluziile confirmă că viticultura intensivă modernă poate reprezenta un model agricol profitabil și sustenabil în Republica Moldova, cu condiția integrării tehnologiilor moderne, a managementului financiar eficient și a orientării către piețele internaționale.

Cuvinte-cheie: viticultură, struguri de masă, sistem Pergola, eficiență economică, investiții agricole, profitabilitate.

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INTRODUCTION

The agricultural sector plays a vital role in the economy of the Republic of Moldova, with viticulture among its most important branches. In recent decades, table grape production has become an increasingly significant segment, judged primarily on appearance, consistency, shelf life and food safety standards, which has pushed producers toward intensive vineyard management systems and integrated post-harvest infrastructure able to compete in export-oriented value chains.

Among intensive training systems, the Pergola (Tendone) system stands out for its superior canopy management, improved local microclimate, higher yield per hectare and better ergonomics for manual labour. However, this approach is capital-intensive, requiring substantial upfront investment in irrigation, disease protection and post-harvest facilities, which raises a critical management question: is this investment financially efficient over the long run, and what is the real payback period?

This research aims to assess the economic efficiency and investment yield of an intensive viticulture model based on the Pergola system, using Via Noastra S.R.L., a modern Moldovan agricultural enterprise, as a case study. It identifies the conditions under which large investments in intensive viticulture become profitable, durable and globally competitive, showing how capital investment translates into productive capacity, operational efficiency and investment returns once the vineyard reaches productive maturity. The central research question is whether the Pergola model generates economically sustainable financial returns at maturity, and what return is achieved on invested capital.

The study combines qualitative and quantitative research methods: a qualitative approach for analyzing relevant international and sectoral literature, and a quantitative approach for analyzing the enterprise's internal accounting and operational data for 2024–2025. The case study methodology is applied for an in-depth assessment of investment efficiency, with results expressed through standard financial indicators (CAPEX, OPEX, ROI, payback period).

The thesis is organized into four chapters. Chapter 1 defines the theoretical and sectoral framework of contemporary viticulture. Chapter 2 presents the case study of Via Noastra S.R.L., covering its production system, technological level and management practices. Chapter 3 provides an economic evaluation of the investment through financial analysis and performance indicators. Chapter 4 summarizes the main findings and outlines strategic recommendations for long-term competitiveness and sustainability.

The aim of this research is to assess the economic efficiency and investment feasibility of applying the Pergola trellis system in modern viticulture, using “Via Noastră” LLC as a case study. The paper focuses on the analysis of production costs, expected yields, profitability indicators, and the main factors that influence investment decision-making in vineyard management.

The objectives of the work:

- to analyze the theoretical and sectoral framework of modern intensive viticulture, including vineyard training systems, quality standards and regulatory environment;
- to evaluate the organizational structure, technological model and management practices of Via Noastra S.R.L. as a case study enterprise;
- to assess the capital investment structure (CAPEX), operational costs (OPEX) and revenue generation capacity of the Pergola trellis system at productive maturity;
- to calculate key investment efficiency indicators, including ROI, net profit margin and payback period, based on internal accounting data for 2024-2025;
- to identify the impact of climatic risk, particularly rainfall during the harvest period, on product quality, average selling price and overall revenue;
- to formulate strategic recommendations for ensuring long-term competitiveness and sustainability of the intensive table grape production model in the Republic of Moldova.

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