

ECONOMIC AND TECHNOLOGICAL ASPECTS REGARDING THE CULTIVATION OF BLUEBERRIES IN THE CONDITIONS OF THE REPUBLIC OF MOLDOVA

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Abstract

Cultivation of blueberries is an entrepreneurial activity recently approached by local farmers, a business with a fairly high economic potential. The nutritional and economic value of this crop fuels an active interest for both consumers and local producers. However, blueberry cultivation represents a risky challenge for potential domestic producers. This fact is conditioned, mainly, by the local natural factors that are unsuitable for the development and fruiting of the blueberry, respectively, for the creation of conditions similar to the natural habitat of the blueberry, considerable investments are required. The aim of the paper is to present a series of calculations proving that blueberry cultivation represents a profitable business in Moldova. The used methodology is based on comparative, analytical methods, and financial indicators that prove the business profitability. With a thorough elaboration of the whole business process, with all the calculations and analysis of the estimated results, as well as the exact forecasting of the risks and the impact, the cultivation and production of blueberries in the conditions of our country can become a successful business.

Key words: blueberry culture, agricultural producers, economic value, planning, investment

INTRODUCTION

Until recently, blueberry culture in the Republic of Moldova was an interest only to amateur fruit growers, being cultivated in the auxiliary sector, and the non-essential harvests obtained were intended for domestic consumption. Accordingly, the majority of the population perceived bilberry berries as an exotic product. As the domestic food market began to be supplied with blueberry products (fresh, frozen, juices, jams), by exporters from Romania, Ukraine and other countries, but also the consumer information campaign regarding the benefits healing properties of blueberries, caused a special interest from the population for the given product. This fact was also noticed by domestic agricultural producers who pointed out in blueberry production an obvious economic opportunity, but also the possibility to diversify their arsenal of blueberry products offered to consumers. Traditionally, the level of fruit consumption, especially of bacifera in our country is quite high, which favors a stable demand on the domestic market for currant,

raspberry, blackberry, and more recently - blueberry fruits. At the same time, the rather high price offered for a kilogram of blueberries mentions the profitability and high profitability that the cultivation of this crop can offer.

The given paper is a reflection of the evolution of the blueberry production sector in the Republic of Moldova, of the economic and technological impediments faced by the respective field. At the same time, this report is a projection of the opportunities that can benefit potential investors determined to invest in the development of blueberry culture in the geographical conditions of our country.

MATERIALS AND METHODS

When preparing the given report, general research methods (empirical and theoretical methods) were used, the analysis of statistical data was applied, reflecting the level of production and use of blueberry orchards both globally and nationally. Primary documents represented by specialized literature (books, monographs, scientific reports and didactic

materials, etc.), as well as secondary documents (statistics by field) were used as sources for the respective report. The information provided by the National Bureau of Statistics of the Republic of Moldova and relevant international organizations was widely used.

RESULTS AND DISCUSSIONS

Cultivation of blueberries in industrial quantities is a relatively new activity worldwide. The global demand for this product is constantly increasing, mainly due to the healthy properties attributed to the fruit. The price for blueberries is therefore high, which is why many countries see enormous potential in this crop. The countries of Eastern Europe, the Balkans and Peru are expanding their blueberry plantations every year. The area under blueberry cultivation exceeded 205,000 ha in 2020 and production is expected to continue to grow strongly in the coming years. Most of the planted area is concentrated in the two American continents, but producers in the Asia-Pacific region are catching up fast. North America, the cradle of blueberry production, continues to be a relevant region for this crop. In South America the blueberry is expanding rapidly, and new areas are being developed in Europe, Africa and Asia [2].

Currently, the main producers and exporters of blueberries in Europe are Spain and Morocco, being also the main suppliers on the German markets. The price of blueberries on the market varies between 0.80 and 1.20 euros for 125 gr. of product, and the average price on European markets for a ton of blueberries is approximately 2,300 - 2,500 euros. As a comparison, the price of this product in stores and on agricultural markets in the Republic of Moldova is 6-10 euros/kg, depending on the condition of the product sold (fresh or frozen). In line with other Eastern European countries, Ukraine is constantly expanding its berry production. Blueberries are one of the most popular products for new plantations in the country, and the export volume varies between 4,500 and 5,000 tons. Most exports go to Poland, Turkey, France and Belarus.

Serbia exports mainly to its region, to Western Europe, Turkey and Russia. The Middle East is also growing as an export market, especially the Gulf countries.

In Italy, the blueberry harvest begins at the end of March in the south of the country and ends at the beginning of September in the northern regions. The demand for blueberries is increasing every year. Compared to last year, it has increased by about 60% in southern Italy. Production is constantly increasing due to technological innovation and the introduction of new varieties. The international network of berry producers *Berryway*, has launched a project to establish a production chain to unite the different Italian territories, to supply fruits 12 months a year [4].

China is the leader in blueberry consumption in Asia due to the growth of its local supply, but also massive imports. Currently the blueberry market is changing: the center of gravity is moving from North America to various regions of the globe. As the market becomes more competitive and consumers more demanding, fruit quality is vital to take advantage of growth opportunities [10].

Romania has over 300 blueberry growers and an estimated annual production between 23,000 and 30,000 tons, this niche developing rapidly in recent years due to the high demand for these products and access to European funds for the establishment of such cultures.

As mentioned, the top seven blueberry exporting countries - Peru, Chile, Mexico, USA, South Africa, Poland and Canada - secured the world market with a volume of blueberries worth \$2.1 billion in 2019. If the external deliveries of these countries will increase by an average of 5% annually then, in the next 5 years, the global exports of blueberries until 2025 will be almost 3 billion dollars. This trend is noted by the fact that the decrease in global blueberry exports has not occurred since at least 2010 and in the period 2015-2019 the annual increase in deliveries was on average 46 thousand tons.

Between 2010 and 2019, world blueberry production increased from 439 thousand tons to 1 million tons. During this time, the number of countries growing blueberries

increased from 26 to 30, while 27 countries saw an increase in the blueberry harvest. Since 2012, the number of countries that annually grow at least 10 thousand tons of blueberries is constantly increasing, and by 2019 at least 11 countries have exceeded this threshold. A rapid increase in yield was observed in Peru, where 125 thousand tons of blueberries were already harvested in 2019 [12].

Blueberry consumers in the Republic of Moldova managed to make significant savings in 2022 when purchasing these extremely healthy berries. If in previous years the market was mainly controlled by two local producers, and wholesale prices for blueberries were 12.5 euros, then 9 euros per kilogram, last summer blueberries were sold at retail prices of 6-7 euros per kilogram cranberries. This is largely due to imports from Ukraine. Ukrainian agricultural producers, despite the war, increased the export of blueberries by 1.5 times in 2022, which led to the collapse of prices for this product in Moldova. At the same time, the total export of fresh blueberries from Ukraine in 2022 exceeded 2.5 thousand tons, increasing by one and a half times compared to 2021. Other important importers of blueberries from Ukraine - the Netherlands, the United Kingdom and Moldova - have suddenly increased import volumes: by 80%, 68% and 2.4 times, respectively. In addition, illegal deliveries with uncontrolled sales in the bazaar should be taken into account in Moldova, which greatly complicates the life of local farmers [11].

Currently, 14 ha of blueberries are registered in the Republic of Moldova, and the global harvest from this area in 2020 was approximately 21 tons. The largest blueberry plantation, approximately 10 ha, is found in the Nisporeni district.

The rest of the plantations have insignificant areas or the given crop is grown on the auxiliary sector, and the production obtained is intended for domestic consumption. The respective situation reveals the fact that blueberry cultivation in the Republic of Moldova is an underutilized niche, with a huge potential that is yet to be exploited at its true value.



Photo 1. The first blueberry production obtained in the Republic of Moldova in 2016

Source: Canal 3, MD, 29 IUNIE 2016, A tasty business, The first harvest of blueberry in the Republic of Moldova [3].

The specific pedological and climatic requirements of the blueberry entail a high degree of difficulty in its cultivation in the conditions of the Republic of Moldova. Due to the natural distribution area - mountain areas with coniferous forests - cultivated blueberries bear fruit only on strongly acidic soils. Thus, in the conditions of our country where soils with a neutral or weakly alkaline or weakly basic PH prevail, the blueberry plant can develop but the flowers do not form the fruit. In order to create the optimal conditions for the growth and fruiting of this crop, it is necessary to create conditions similar to the original habitat or to modify the soil reaction to a PH of 3.0 - 3.5. This fact, in addition to the necessary technological operations, involves significant expenses and large investments in soil adjustment, water supply, etc.

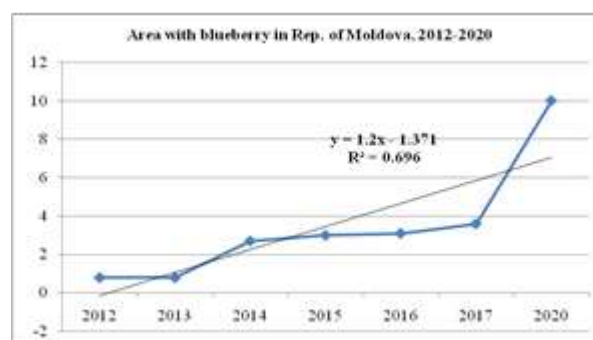


Fig. 1. Area with blueberry in Rep. of Moldova
Source: Own design and calculation based on the data from [13].

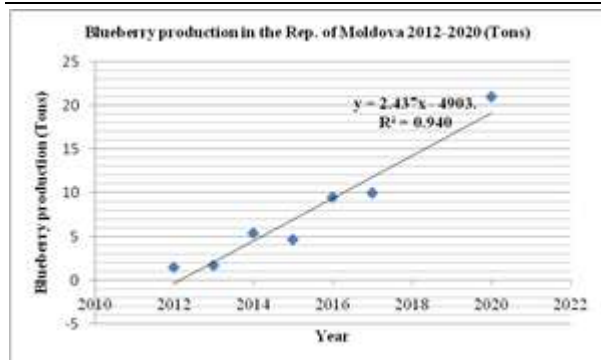


Fig. 2. Blueberry production in the Rep. of Moldova, 2012-2020 (Tons)

Source: Own calculation and design based on the data from [13].

As a result, domestic blueberry prices are directly influenced by three important aspects: the high cost of production, small production areas and the less favorable conditions for the given crop.

In the given context, the establishment and exploitation of a blueberry plantation in the conditions of the Republic of Moldova requires the use of a huge volume of financial resources.

They can be obtained by attracting investments from various state or private investment sources. In order to obtain the given resources, the manufacturer is obliged to implement an extensive investment process consisting of a series of stages.

The given phases represent a sequence of activities carried out in a well-determined order with the aim of designing and achieving an efficient management of financial and production resources.

The stages of the investment process involved in an entrepreneurial activity based on the production of blueberries are the following:

The concept of the idea - the future entrepreneur analyzes a wide spectrum of economic activities or fields of activity in which he could manifest himself most effectively, studies the market, the level of competition in the given segment, analyzes his technical and material capacity to initiate and develop the given business.

This phase, as a rule, does not require significant financial investments, and its success depends on the analytical capabilities of the potential entrepreneur.

The given principle is also valid for the future blueberry producer. Initially, the market and ways of making blueberries will be studied, the level of market saturation with the respective product, the current and potential competitors that may appear on the given market will be determined, an attempt will be made to identify other markets for making.

Next, the technical-material capacities of the decision-maker will be established, it will determine the size of the plantation surface to be established and exploited.

Business planning and initiation - is one of the most important phases in the entrepreneurial sphere and includes two sides: the organizational-legal phase and the technical-financial side.

The organizational-legal part is reflected in the previous subchapter. Technical-material planning aims to determine and efficiently use the available technical, technological and workforce resources.

Depending on the level and capabilities of insurance with these factors, the basic constituent of the business is determined - the financial or investment component.

The prosperity of a successful entrepreneurial activity is directly proportional to the entrepreneur's ability to effectively attract and manage available financial resources.

Thus, financial management persists in all stages of the company's development - starting with its foundation and ending with its liquidation.

Given the fact that the production of blueberries involves a long process that includes a time interval that can exceed 25-30 years, the investment management is very complex. This fact is due to the need for considerable financial resources in the phase of establishing the plantation, the period of maintenance of the plantation until it bears fruit, as well as the time interval characterized by the maintenance and obtaining the expected production.

The formation stage - the period of business initiation where various grants, personal savings, personal credit, subsidies, fixed capital represent investment sources.

For the respective business, this stage requires the largest volume of investments. This fact is

explained by very high consumption consisting of: expenses for the design of the plantation;

the cost of planting material, the large volume of technological works applied to the establishment of the plantation; expenses incurred for the design, procurement and installation of the irrigation system.

Growth stage – the period of growth of the household, characterized by the procurement of the necessary equipment, planning, analysis, development and promotion of the marketing plan. During this period, such investment sources as: free cash flow, commercial loans, accrued interest, bank loans, leasing, venture capital and different financial assistance are used.

For the blueberry household, this period ranges from the first year of maintenance to the 10-12th growing year, when the blueberry crop begins to yield more uniform yields.

Maturity stage – the enterprise expands, enters new markets, diversifies products and innovates. Such investment sources as: risk capital, capital markets, dividends are used.

It is the period when the household obtains maximum harvests with optimal expenses, it can be an opportune stage to expand the area of the plantation, the implementation of new more efficient technologies, the procurement of production processing lines to diversify the form and content of blueberry products which would lead to an increase in value their additions. It is a beneficial period for increasing and streamlining the product value chain.

Decline stage – the enterprise restricts its activity, liquidates or reorganizes its activity.

It coincides with the period when the volume of the blueberry harvest starts to decrease, respectively and the income decreases. At this stage, free cash flow, other sources of investment are used [6].

About 85% of the agricultural budget is intended for agricultural producers (subsidies, premiums, direct payments for the production of goods, transfers, investments, etc.) aiming at the operation of the agricultural market, the increase of incomes and on this basis the provision of sources of financing for production and investments.

Agricultural credit is not a substitute for subsidies, but harmonizes with the system of supporting agricultural producers through the use of subsidies that ensure the necessary resources for the value of investments, the development of the production process and the sale of products.

The main mechanism for agricultural and rural development must become credit. In this way, the most important financial resources can be mobilized. The development of credit does not eliminate subsidies for rural development, but is harmonized in order to form a profitable business.

Credit plays a decisive role in the normal functioning of the market, in the concentration of small capitals and the financing of investment objectives. That is why internationally accepted agricultural policies and financing mechanisms based on available natural resources and institutional structures are needed.

Currently, the main agricultural lending institutions are banks and microcredit organizations that provide farmers with a wide range of products.

The offer involves granting both short-term loans (which cannot exceed 12 months), medium-term loans (with a repayment period of 1-5 years) and long-term loans (with a repayment period of more than five years).

Rural financial markets have not expanded due to the poor performance of the private sector and the low volume of credit ceilings for investments secured by the banking system.

Although the number of rural depositors is high, the supply of credit in this environment is weak and the number of credit transactions is low. Credit for investment in agriculture is limited not only by bank resources, but also by the ability of applicants to develop the investment project.

With the determination of the forms of financing, approval of the most effective method of financial management, the blueberry producer moves to the production stage where the implementation and observance of modern production technologies has a decisive role.

Taking into account the fact that the conditions for the development of blueberries in the geographical area of the Republic of Moldova differ from those authentic to the given culture, the blueberry grown here is more strongly attacked by a series of specific and non-specific pathogens and pests.

Moreover, the expansion of the spread area of the given culture is also accompanied by an increase in the incidence of pathogens and pests. Entrepreneurial activity entails a certain risk, materialized through financial losses.

Forecasting and objective assessment of potential danger situations requires a special approach to these problems.

Therefore, the identification of risks, the assessment of potential damage and the establishment of methods to combat this phenomenon must be carried out before starting the business.

Currently, the domestic agricultural sector is the field with the greatest exposure to risk conditions, being determined by social, economic, political factors and last but not least – unfavorable climatic conditions.

As a result, the entrepreneurial activity in the given sector is constantly under the pressure of these elements which, in turn, are distributed in the following way:

- a. Production risks;
- b. Market and price risks;
- c. Business and financial risks;
- d. Technological risks;
- e. Accidental risks;
- f. Social risks;
- g. Human risks;
- h. Political risks [7].

As measures to combat these situations, it is the implementation and observance of scientifically proven production technologies, the appropriate provision of the technical - material base according to the technological requirements in force, the full observance of the requirements related to the establishment of the plantation, the geographical location, the quality of the soil and water for irrigation, cultivation of blueberry varieties approved for our conditions

CONCLUSIONS

The cultivation of blueberries in the Republic of Moldova is a new occupation, respectively, and the final product - blueberry fruits are little known to the domestic consumer. But, thanks to active promotion through all means of information, this product is increasingly making its way into the list of preferences of the local population.

The natural habitat of blueberry crops are mountainous geographical areas, where soils with a strongly acidic reaction predominate. Given the fact that most soils in the Republic of Moldova have a neutral reaction, with non-essential deviations, it is necessary to artificially create optimal conditions, defined by the formation and maintenance of the chemical composition of the soil substrate corresponding to the beneficial development of the root system. This fact requires substantial investments both for the procurement of the necessary material (peat, conifer bark) and for the maintenance work to be carried out annually. This fact requires the future producer to initially carry out a relevant analysis of his capabilities to correctly and objectively determine the necessary resources, as well as to identify the sources and methods of attracting the necessary investments.

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