ECONOMIC PROJECTIONS FOR SETTING UP A BLUEBERRY PLANTATION

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Abstract: *Romanian's blueberry industry follows closely the current international trend. Areas occupied by blueberry crops and the consumer demand for fresh blueberries increase annually. Due to this growing demand, blueberry industry in Romania has a great development potential. The paper presents the resources needed to start a blueberry plantation, as well as the results that future investors can expect. In this sense, the financial data of two already existing plantations were analyzed. The results of this study, highlights the profitability of blueberry culture.*

Key words*: blueberry, business plan, supply chain, rural development*

INTRODUCTION

Blueberry is a fruit belonging to the group of "superfoods" due to its antioxidant benefits, and one of the fruits with the greatest growth in demand in the international market [10,11,12] and national market [3]. Romania was in 2013 in the first ten countries by blueberry production according to [5, 8]. In Romania, the first blueberry plantation was established in 1968, at the Bilcesti Research Station situated in a mountain region, with excellent pedological and climatic characteristics for the cultivation of blueberries [1,3,5,8,14]. Later, the blueberry crop expands in all country regions and due to the high adaptability and tolerance to the environment difference, the crop can be found even in the non-specific areas of culture [3].

Between 1975 and 1989, more than 250 ha were used for blueberry production. After 1989, many of those surfaces were abandoned leading to a decrease in cultivated areas of less than 30 hectares in 2000 [5]. After 2007, thanks to supporting European Programmes, as sub-measure 4.1a Investments in fruit holdings, the areas covered by Highbush Blueberries (*Vaccinium corymbosum L.*) increased to over 700 hectares in 2016 [5]. A similar trend of fast increasing areas and production for blueberries was noticed in USA [3,9] and in Europe. Despite this increase, only 10% of the worldwide blueberry cultivation it is located in Europe [9].

The main varieties grown in Romania are: Bluecrop, Blueray, Bluetta, Burlington, Collins, Coville, Darrow, Earlyblue and Ivanhoe [2]. Of these, the most productive variety is Bluecrop [6], and the most appreciated by consumers is Coville [4]. The structure of Romanian farms is fragmented, with an average of 3.45 ha per holding [7]. This fragmented structure can be suitable for high end cops like blueberry.

The aim of this research is to identify the investment opportunity in blueberry plantation. This work is designed to provide a clear overview of economic projections for blueberry growing activity.

MATERIALS AND METHODS

Data processed in this research were procured from two technical projects for setting up blueberry plantations, from two companies: First company is based in Cluj Country, Gherla area, and second company from Brasov county. Both companies have set up blueberry plantations in a super intensive cultivation system in the last 3 years. The data collected concerned the costs of setting up the blueberry plantation. There were no major differences between the initial investment per hectare for those two plantations, which were almost equal. Standard costs for land preparation and planting on raised beds are equivalent with the following Guideline [13].

The culture system used is the super-intensive one with a distance between rows of 3 meters and 0.8 meters between plants per row. The density of the plants will be 4,162 per hectare.

Table 1.

Standard set-up costs

	Eur/ha	**Lei/ha**
Design, soil analysis, technical assistance	620	3,007
Land preparation	840	4,074
Irrigation equipment	3,500	16,975
Installation of irrigation equipment	500	2,425
Fertilization and disinfection	8,175	39,648
Planting material*	8,362	40,555
Planting labor*	1,415	6,862
TOTAL	23,412	113,546

*The average cost for the blueberry plant is 2 euros, and planting cost is 0.34 euros per plant. For this system it's used a density of 4,162 plants/ha.

** Exchange rate 1 euro = 4.85 Ron

Maintenance costs are 4,400 euros/year/ha in the first 2 years. This includes expenses with mechanized works for mowing, fertilization, phytosanitary treatments, manual works represented by the pruning cuts as well as expenses with the materials used [**2**]. From year 3, the year when the blueberry crop starts to register economic productions, the expenses with the harvest in the amount of 4,500 euros/ha are added.

The horticultural works estimate an average production of 10 tons per hectare for the super intensive system. The average selling price of blueberries is 10 RON per kg.

The elements considered for the cost and profitability analysis for super-intensive crop system were: the number plants per hectare, the total value of initial investment, total exploitation period, yield and cost of production.

The method used involved the calculation of the following indicators: Annual production value, Annual return, Annual return rate, Investment recovery period, Investment return rate.

RESEARCH RESULTS

Data presented in Table 2 provides an overview of several economic indicators on the performance of blueberry cultivation. As this crop begins to have economic productions from year 3, the calculations were made for year 3.

The initial investment for one hectare of blueberries is 23,400 euros. Annual maintenance costs are 8,900 euros. Most of these expenses are generated by the necessary labor force. Blueberries intended for consumption, must be harvested by hand. Because of this, harvesting costs represent 51% of total annual maintenance costs. At an average harvest of 10 tons / ha, the production cost is 4.32 lei / kg.

The wholesale price for blueberries is 10 lei / kg. This means that the annual production value for one ha is 100,000 lei, and the annual return is 56,835 lei for each ha. The annual return rate is 57%. According to [15], annual return rate has to minimum 10% to meet the financial requirements in order to have access to financing through sub-measure 4.1a.

Blueberry bushes have an exploitation period of 27 years [13]. The initial investment is recovered in the first 2 years, after the crop begins to produce (year 3). According to [15] investment recovery period must be maximum 12 years.

Investment return rate is 50%. According to [15] the minimum value for this indicator is 5%. A 50% investment return rate means that for each year of exploitation, the annual return is equal with half of the initial investment.

Table 2.

The analyze of the economic efficiency of blueberry

Item	Unit	Value
Initial investment value	lei	113,546
	euro	23,412
Annual exploitation costs	lei	43,165
	euro	8,900
Yield	kg	10,000
Production cost	lei/kg	4.32
Annual production value	lei	100,000
	euro	20,618.56
Annual return	lei	56,835
	euro	11,718.56
Annual return rate	%	57%
Investment recovery period	years	2.00
Investmant return rate	%	50%

Figure 1 present the annual evolution of blueberry crop. The data used include start-up costs, annual maintenance costs, income, yield and cash flow.

Figure 1. Cashflow evolution in first 6 years

The first two years represent the period where the crop is prepared through mechanical and manual works such as mowing, fertilization, phytosanitary treatments and pruning cuts. The main purpose for those years is to prepare the crop for economic productions.

From year 3, the crop starts to have significant productions of 10 tones/ha. All indicators presented in Table 2 were calculated for year 3. The recovery period for initial investment of 2 years is being considered form this year (year 3). In terms of cash flow, the breakeven point is registered in year 4. This means that after 4 years from the initial investment and 2 years form the first significant production (year 3), the blueberry culture manages to reach the breakeven point.

Form year 5, the cash flow is positive, and the culture manages to obtain profits of over 10,000 euros/year/ha. For a total exploitation period of 27 years, the blueberry crop can a return of overs 250,000 euro/ha.

CONCLUSIONS

- Investing in a blueberry crop is one of the most profitable investments in the horticulture sector, with an annual return of over 10,000 euros/ha starting with year 3.
- The activity register a positive cash flow from the first years of activity. The breakeven point is reached in the 4^{th} year after planting and in 2^{nd} year of production.
- A great advantage of blueberry crop is the low necessary surface. The activity can be started with small areas of up 1 or 2 hectares.
- Due to the high labor force required for harvesting, blueberry cultivation creates up to 2 full-time jobs per each hectare [10]
- Blueberry growing activity is encouraged and supported by the European Union and Romanian Government. In this sense, there are several financing programs. A list of those programs: PNDR 2014-2020, sub-measure 4.1a, sub-measure 6.1 and sub-measure 6.3.

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