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THE NECESSITY OF DEVELOPING BLUEBERRY PRODUCTION

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Abstract

This article presents the advantages of cultivating blueberries, both economically and from an alimentary and therapeutic point of view. By calculating profit per hectare for the most productive varieties of blueberry, it was shown that this culture is particularly profitable for young farmers. In fact, blueberries have significant therapeutic value, being used in food and pharmaceutical industry.

***Key words*:** *blueberries, productive varieties, profitable, therapeutic value*

INTRODUCTION

The blueberry fruits were used in ancient times by indigenous peoples in North America, especially for their healing properties, because they originate from this area [1]. It is mentioned as a medicinal plant in Europe from the twelfth century, used especially for lung and liver diseases and to treat wounds.
Forest fruits production has increased in recent years as consumers discover their healing effects and more. According to the Statistical Yearbook of Romania, forest fruits production increased in 2011 compared to 2008 to 41.57% as of 6493.5 tones [2].
Forest fruits now gain more popularity among consumers due to their benefic effects.
They contain many useful substances for people like vitamins, proteins and anthocyanins (those substances that give fruit red or blue color).
Blueberry extract is great for increasing visual acuity and the circulatory system, being recommended for people with low blood pressure or those with diabetes, myopia, arthritis, varicose veins and hemorrhoids.
It is important to mention the fact that there is no adverse effect of using blueberry extract for both nutrition and therapeutic purposes.

MATERIALS AND METHODS

For this study we used data collecting methods such as bibliographic study (books, articles, Statistical Yearbook of Romania and Internet addresses). Among the methods used for collecting and processing I used: document analysis, statistical and mathematical analysis, and data interpretation methods such as the deductive method.
The standard range deviation is calculated using the formula $\sqrt{X} = \sqrt{\frac{(x-y)^2}{(n-1)}}$, where y is the average of 5 years.
The variation coefficient $c\% = \frac{\sqrt{X}}{y} \times 100$ is the ratio between the standard range deviation and the average of 5 years.
The variation coefficient has the following limitations: up to 10%, c% is low in value, between 10.1% and 20%, c% has a medium value and more than 20.1%, the value of c% is high.
To calculate the most productive varieties of blueberries, I used average standard deviation, average production per plant for 5 years and confidence limits[3].
The average standard deviation is calculated using the formula $\sqrt{\bar{X}} = \sqrt{\frac{(x-y)^2}{n(n-1)}}$, where y is the average production per plant in 5 years.

Confidence limits are of two types: upper limit, which is calculated as $y+\sqrt{\bar{X}} \times Tp$ and the lower limit, which is calculated as $y-\sqrt{\bar{X}} \times Tp$. Tp is the probability of transgression.
The probability of transgression is 2.13 for a 90% probability to a 10% risk.
Oscillation amplitude of the confidence limits= $((\bar{X}+ðx*tp - \bar{X}-ðx*tp)/(\bar{X}))*100$

RESULTS AND DISCUSSIONS

The therapeutic and alimentary importance of blueberries (Vaccinium corymbosum)

Blueberries have significant therapeutic value because of their content in organic substances such as anthocyanins, tannins, and phenolic acids, salts of potassium, calcium, phosphorus, sulfur, magnesium, chlorine, manganese, iron, vitamins A, C, E, PP, B1, B2 and proteins. In fact, blueberries are considered the best antioxidant fruits.
Blueberries' antioxidant activity is 10 times higher than that of other fruits and vegetables [4].
Both blueberry fruit and leaves are astringent due to tannins. They have antibacterial activity, altering in a favorable way the intestinal pathogenic flora. The leaves are used in the composition of dietary tea. The fruits are used to prepare cakes, jams and other sweets or to obtain blueberry liquor.
The fruit can be eaten fresh; they are indicated especially for increasing immunity and are recommended for people who suffer from obesity [5].
Blueberries and blueberry leaves can be used in the cosmetic industry in poultices and masks due to the antibacterial effect.
In our country, blueberries are not consumed in large quantities; they are being sold by traders especially in mountain areas.
This fruit are actually of spontaneous flora [6] and is an insignificant amount compared to what we could produce. In Romania, the first blueberry crop was established in 1968 with the varieties Blueray and Coville [4].
The biological particularities of the blueberry tree are various forms (shrubs) and heights from 0.6 m to 2.5 m, the fruits are grouped in racemes and are resistant to frost.
The fruit is a berry, spherical, flattened in most varieties [7]. The fruiting period starts in the first four years after planting, and the yield per hectare is 5-10 tones [4], a ton of blueberries bringing a profit of 3,000 Euros.
In our country blueberries are sold by the producer in season for 4 RON per kilogram and a pound of blueberries given to export reaches 3-4 Euros.
Also, in the local markets a kilogram of blueberries can even get to 15 RON.

Blueberry production per plant

Table 1 presents data with reference to the average blueberries production per plant, in kilograms. Using calculation methods, we could identify the most productive varieties of blueberries.

Table 1. Size of the average standard deviation and oscillation amplitude of the confidence limits for blueberry production per plant

Variety / Years	Average 1999-2003	Average Standard Deviation	Confidence Limits Probability 90%, risk 10%		Amplitude of the confidence limits %
			Min.	max	
Bluecorp	1.7	0.57	0.48	2.92	143.5
Blueray	1.71	0.39	0.87	2.55	98.2
Herbert	1.27	0.34	0.54	2.01	115.7
Ivanhoe	1.07	0.23	0.58	1.56	91.6
Coville	1.3	0.31	0.63	1.96	102.3
Rubel	1.4	0.4	0.55	2.25	121.4
Burlington	1.15	0.33	0.44	1.85	122.6
Zuckertraube	1.14	0.37	0.36	1.92	136.8
Atlantic	0.8	0.19	0.39	1.21	102.5
Pioneer	1.13	0.35	0.38	1.88	132.7
Pemberton	1.9	0.42	1	2.8	94.7
Collins	0.77	0.17	0.41	1.12	92.2
Weymouth	0.63	0.12	0.38	0.87	77.8

Source: Processed data from Bădescu C., 2004, Ph. D. Thesis.

Economic efficiency of the blueberry culture

To calculate the coefficient of variation of gross profit for blueberry culture I used the standard range deviation and the average of five years of full fruiting period.

Regarding the variation coefficient of profit, in Table 2 we can see that its value is 54.83%, thus having a very high value.
This means that the profit varies significantly from 9959.88 RON in the first year to 42,495.47 RON in the last year.
Profits may be doubled but if we use the most productive varieties and appropriate culture technology.
Regarding the production expenses the calculation demonstrates a medium variation which means certain homogeneity of expenses during the studied years.

Table 2. Size of the standard range deviation and variation coefficient of the production indicators for the period 1999 - 2003

No.	Specific.	MU	Years' Average	Standard range deviation	Variation coefficient	
					%	Signif.
1	Production	kg/ha	22177,3	10661,15	48,07	High var.
2	Production Value	RON	33265,9	15991,73	48,07	High var.
3	Production Expenses	RON	5643,93	1023,28	18,13	Med.var.
4	Gross Profit	RON	27622,0	15143,49	54,83	High var.

Source: Processed data from Bădescu C., 2004, Ph. D. Thesis.

CONCLUSIONS

Forest fruits are consumed increasingly more due to their therapeutic properties and their numerous uses.
Of these, blueberries are best in terms of alimentary and therapeutic purposes, both fresh and canned or dried.
Upon completion of calculations using statistical and mathematical analysis methods it was found that the most productive varieties of blueberries are Bluecorp, Pemberton, Blueray, Rubel and Herbert.
Using these varieties a considerable profit can be achieved within 5 years.
Even if the investment and maintenance costs of the blueberry culture are high the profitability is significant, reaching very high profits because of the demand for these fruits is increasing especially in Western countries, for use in pharmaceutical and food industry.
Young Romanian farmers should turn to this culture due to its high profitability.

REFERENCES

[1]Hancock J.F., 1989, Blueberry research in North America, ISHS IV, International Symposium on Vacccinium Culture, Acta Horticulturae, 346
[2]Romanian Statistical Yearbook, 2008-2011
[3]Ceapoiu N., 1968, Metode statistice aplicate in experientele agricole si statistice, Ed.Agro-Silvica, Bucuresti
[4] Bădescu Cătălin, 2004, Contribuţii la promovarea culturii afinului în zonele submontane din România, Teză de doctorat, Bucureşti, 5-9, 160-167
[5] Matei Gina, 2010, Afine pentru diabetici, Jurnalul Naţional
[6]Chira Lenuţa, 2000, Cultura arbuştilor fructiferi, Ed. M.A.S.T. Bucureşti
[7] Braniște N., 2000, Ghid pentru pomicultori-Cultura speciilor pommicole a arbuştilor fructiferi şi a căpşunului în România, Ed. Ceres, Bucureşti