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ECONOMIC ASPECTS OF WALNUT SEEDLING PRODUCTION ON A FAMILY FARM

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Abstract

There are profitable conditions for walnut production in Serbia. However, there is a trade gap of this fruit. Recently, a demand for walnut seedlings is in growth. The cause of this is new walnut orchards establishment, but large investments discourage producers.

The subject of this paper is the economic analysis of walnut seedling production on a family farm, with the aim at observing the influence of production factor to the economic indexes.

Solving problems and tasks set during the research required the use of appropriate methods, including: methods for determining costs, analytical calculations for plant production and methods for determining indicators of economic success of family farms. In addition to these methods was used and the method of comparative analysis.

Data on farm production for the years 2006 and 2007 have been used for this paper as well as the results of the former researches as the basis for a detail study of specific problems.

On the basis of calculated and analyzed economic indexes, the family farm ran business successfully in both years and managed to have positive financial result, which confirms walnut production profitable, although it has been set on a small area of the family farm.

Key words: *economic indicators, family farm, production, walnut seedlings.*

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Introduction

Walnut is one of the most important fruits in the world. Walnut kernel is the first class concentrated food, very rich with fat, albumens, carbohydrates, mineral substances and vitamins (5). Its wide usage in nutrition, medicine, alimentary, wood and leather industry makes it one of the most appreciated fruit crops. Almost all parts of walnut have manifold and wide usage in everyday life. Walnut tree is considered to be very precious material in furniture industry. Its characteristics are great solidity, hardness and plasticity, that is why it is easily treated.

Walnut is widely spread (6). The most important regions for walnut growth in Serbia are Timok, Podrinje, Zapadna Morava, Juzna Morava, Metohija, Fruska gora, etc. Mostly it is produced in individual holdings. As a result of that, smaller part of production is current, while major part is spent within household.

There are profitable conditions for walnut production in Serbia; however there is a trade gap of this fruit. Walnut import is greater than its production. Recently, a demand for walnut seedlings is in growth, the cause of this is new walnut orchards establishment. Great number of producers are interested in walnut production, but large investments are discouraging (3).

The subject and the aim of the paper

The subject of this paper is the economic analysis of walnut seedling production on a family farm, with the aim at observing the influence of production factor to the economic indexes.

Economic analysis shows negative factors which contribute lower extent and production quality.

Research methods and data sources

Solving problems and tasks set during the research required the use of appropriate methods, including: methods for determining costs, analytical calculations for plant production and methods for determining indicators of economic success of family farms (1). In addition to these methods was used and the method of comparative analysis.

Data on farm production for the years 2006 and 2007 have been used for this paper. However, these data have not been enough for the complete explanation of some problems and manifestations that is why the results of the former researches have been used as well, as the basis for a detail study of specific problems.

Research results

Number of produced seedlings on a family farm

Numerous factors influence the number of produced walnut seedlings: natural conditions, seed quality, grafter's skill, graft quality and application of agricultural

engineering methods and measures (2).

Sorts of walnut seedlings produced on the farm are Sejnovo, Geisenheim 139, Rasna, Sampion and Kasni grozdasti which were grafted on the rootstock *Juglans Regia L.*

In table 1 there is a review of seedling production according to classes, for the years 2006 and 2007.

Table 1. Walnut seedling production according to class for the years 2006 and 2007 (pieces)

Seedlings class	2006	2007
I	1310	1240
II	610	560
III	95	90
Total	2015	1890

Conclusion can be made from the previous table, that the number of extracted seedlings in the year 2007, compared to the previous year, was less for 6.2%. The reason for that were extremely high temperatures during summer months which devastated a number of seedlings.

In table 2 there is a review of the total number of obtained rootstocks, taken grafts and extracted seedlings compared to the number of sown seeds.

Table 2. The number of obtained rootstocks, successful grafts and extracted grafted seedlings in 2006 and 2007 (pieces)

Year	No. of rootstock seedlings	No. of obtained rootstocks	No. of successful grafts	No. of extracted grafted seedlings
2006	3000	2840	2530	2015
2007	3000	2810	2490	1890

Almost all technology in walnut seedling production was applied on the observed farm, except for the anti-hail protection network. That considers applying all the necessary agricultural engineering measures like irrigation, applying necessary chemical substances, reinforced nutrition with manures and fertilizers, providing temperature conditions for keeping flails and engrafts, cording seedlings, milling and hoeing up. Reduced technology do not consider most of these operations, which leads to the reduced number of obtained rootstocks, percentages of taken grafts and the number of obtained seedlings. This way obtained seedlings are usually of lower quality, with lower presence of the I class seedlings for more than 50% and by that profit from their production is considerably less. Total number of seedlings would be less for more than 25%.

Table 3. Expected number of seedlings and revenue when applying various technologies (pieces)

Seedlings class	The number of seedlings (pieces)		Price (€)	Revenue (€)	
	reduced technology	complete technology		reduced technology	complete technology
I	685	1370	10	6850	13700
II	570	610	6,25	3562,5	3812,5
III	185	45	2,5	462,5	125
Total	1440	2025	0	10875	17637,5

1 € = 80 RSD

In table 3 there is a review of profit which is expected in normal production conditions when applying various technologies (reduced and complete), and in table 4 there is a comparison of profit when applying these two technologies.

Table 4. Comparison of revenue and expenses when applying different technologies (€)

	Reduced technology	Complete technology
Revenue	10875	17637,5
Expenses	5893,75	9325
Profit	4981,25	8312,5

1 € = 80 RSD

Economic analysis of walnut seedlings production

Economic analysis of walnut seedling production has been done on the basis of accounting calculation for the years 2006 and 2007. To do this kind of analysis, calculations (table 5), by which value of production on the farm is compared with expenses of production, has been made, as well as achieved financial results.

Table 5. Costs calculation for 2006 and 2007 (€)

No	Type of costs	2006.	2007.
1.	Fertilizers	107,77	120,85
2.	Pesticides	82,48	96,73
3.	Electricity	472,25	608,17
4.	Water consumed	25,17	36,17
5.	Cost filings	120,41	150,75
6.	The foundation seed costs	60,20	100,50
7.	Postal costs	161,35	192,71
8.	Fuel and lubricants	51,78	67,84
9.	Food costs of workers	838,05	1020,10
10.	Seasonal work	1561,11	1785,18
11.	Review of seedlings costs	144,49	188,44

12.	Declarations and labels	50,57	62,81
13.	Insurance premium	1023,48	1105,53
14.	Payment contribution to farm owners	1733,90	1809,05
15.	Costs of packaging	0,00	100,50
16.	Maintenance	97,53	402,01
17.	Service of rototilling and plowing	108,37	115,89
18.	Office supplies	50,57	16,33
19.	Small inventory	14,45	0,00
20.	Depreciation	655,03	683,42
21.	Property tax	14,81	15,28
I	Total costs	7373,75	8678,27
II	Total revenue	12995,18	13909,55
III	Profit (II – I)	5621,43	5231,28

National Bank of Serbia: 07.09.2006. 1 € = 83,05 RSD, 07.09.2007. 1 € = 79,6 RSD

Production value analysis

Production value represents produced scope of the production and selling price per product unit. According to the seedling classes, gained income from selling is presented in table 6.

Table 6. Gained value of walnut seedlings production for the year 2006

Seedlings class	The number of seedlings (pieces)	Selling price (€)	Revenue (€)
I	1310	7,83	10252,86
II	610	4,21	2570,74
III	95	1,81	171,58
Total	2015	-	12995,18

National Bank of Serbia: 07.09.2006. 1 € = 83,05 RSD

On the observed farm for the year 2006, gained value from walnut seedling production was the amount of 12,995 € or 6.42 € per seedling.

Expected production value in the year 2006 was larger than gained, despite the fact that larger number of seedlings was produced than it was expected. This was influenced by considerably lower gained prices of sold seedlings than those formulated according to grouping, which were up to 12.04 € and the prices expected on the farm. Lower gained seedling price on the farm was in fact the reason caused by selling seedlings in larger amounts to one or two buyers. The advantage of that was lower number of unsold seedlings.

Gained production value for the year 2007 was in amount of 13,909.55 €, that was 7.36 €/seedling. This was more for 2.59% of production than the previous year. Gained production value in the year 2007 made 79.75% from planned amount of 16,865.58 €.

Table 7. Gained walnut seedling production value in the year 2007

Seedlings class	No. of seedlings (pieces)	Sale price (€)	Revenue (€)
I	1240	8,79	10914,57
II	560	5,03	2814,07
III	90	2,01	180,90
Total	1890	-	13909,55

National Bank of Serbia: 07.09.2007. 1 € = 79,6 RSD

In the year 2007 it was gained larger production value than in the previous year, because of higher production price gained, although it was produced less seedlings. Lower prices were also gained this year, than those formulated according to grouping (15.07 € for the first class). The number of produced seedlings of all classes was reduced in the year 2007 than in the year 2006 for 6.2%. The mostly reduced was the number of produced first class seedlings – for 70.

Total gained production was lower than expected for about 100 seedlings, where the highest exception was for II class seedlings (13.85%), while there was growth in production of III class seedlings for 80%.

Analysis of production costs

The aim of this analysis is to establish dominant expenses in order to examine possibilities of their reduction, then a specific group of expenses exception during one year from a round of years, and in general the possibility of reducing total amount of expenses for the purpose of improving total financial result (Table 8).

Table 8. Walnut seedling production costs for the year 2006 and 2007 (€)

Costs elements	2006	%	2007	%
I Material costs	512,82	6,95	736,17	8,48
1. Mineral fertilizers	107,77	1,46	120,85	1,39
2. Pesticides	82,48	1,12	96,73	1,11
3. Consumed water	25,17	0,34	36,17	0,42
4. Packages	0,00	0,00	100,50	1,16
5. Fuel and lubricants	51,78	0,70	67,84	0,78
6. Small inventory	14,45	0,20	0,00	0,00
7. Declarations and labels	50,57	0,69	62,81	0,72
8. Costs of seeds for rootstocks	60,20	0,82	100,50	1,16
9. Cost filings	120,41	1,63	150,75	1,74
II Cost personal services	205,90	2,79	517,90	5,97
10. Maintenance	97,53	1,32	402,01	4,63
11. Service of rototilling and plowing	108,37	1,47	115,89	1,34
III Labor costs	4133,05	56,05	4614,32	53,17
12. Temporary work force	1561,11	21,17	1785,18	20,57
13. Nutrition of workers	838,05	11,37	1020,10	11,75

14. Payment of contributions	1733,90	23,51	1809,05	20,85
IV General expenses	684,17	9,28	817,21	9,42
15 Office Supplies	50,57	0,69	16,33	0,19
16 Electricity	472,25	6,40	608,17	7,01
17 PTT	161,35	2,19	192,71	2,22
V Intangible costs	159,30	2,16	203,72	2,40
18. Property taxes	14,81	0,20	15,28	0,18
19. Seedlings control	144,49	2,00	188,44	2,17
VI Depreciation	655,03	8,88	683,42	7,88
VII Insurance premium	1023,48	13,88	1105,53	12,74
IX Total costs	7373,75	100	8678,27	100

National Bank of Serbia: 07.09.2006. 1 € = 83,05 RSD, 07.09.2007. 1 € = 79,6 RSD

The amount of expenses is significant for producers manifoldly. Reduction of expenses enables business result growth, reduction of product price, and by that, growth of its competitive ability on market. According to expenses, producers make business decisions.

From the previous table we can notice that the major part of gained expenses in the year 2006 make working expenses (56.05%) of which periodical workers and their feeding even 32.54%. Expenses for walnut seedling insurance took great part (13.88%), then general expenses with 9.28% of which electricity took majority with 6.4%.

Replacement cost expenses took majority of 8.88% as well. There needs to be mentioned that unlike several years lasting plants, which represent basic mean, for which replacement cost expenses are being kept balancing accounts, plants which give products once at the end of one year or several year lasting period are not considered as basic mean, (i.e. seed-plots of fruit seedlings, seed-plots of ornamental trees and brushwood, etc.), that is why they do not have replacement cost expenses. Since the equipment used for production had already been amortized (milling machine, pump, etc.) we only amortized the construction.

Expenses for material in total amount of expenses were 6.95%. Among these expenses, dominant were expenses for mineral manures, fertilizers and means for protection, although their amount in total expenses was low, only 2.58%. Likewise, for the year 2007, dominant were working expenses with 53.17% of which 33.05% went on daily allowances and periodical workers' feeding. The cause of this was growth in food expenses in the year 2007.

Afterwards, there were insurance expenses with 12.74%, then general expenses of 9.42%. One of the causes was electricity price growth in the year 2007. There was a growth of expenses of materials, mostly because of the growth of water spending, which was caused by high temperatures and long lasting drought, the reason why seedlings were abundantly irrigated.

There was also high exception at self service expenses, caused by damage on milling machine and reparation of equipment for temperature regulation.

Examination expenses were also increased by the republic inspectors.

From the previously given facts, we can notice that all expenses in the year 2007 were increased (except for the replacement cost), and mostly working and self service expenses.

Financial result analysis

Insight into the farm progress in gaining financial result can be made by time comparison to economic business indexes (4) (Table 9).

Table 9. Financial result analysis of walnut seedling production (€)

Year	2006	2007
1. Revenue	12995,18	13909,55
2. Expenses	7373,75	8678,27
3. Net income	5621,43	5231,28
Net income per seedling	2,79	2,77

National Bank of Serbia: 07.09.2006. 1 € = 83,05 RSD, 07.09.2007. 1 € = 79,6 RSD

Financial result per seedling in both years was positive, but with the reduction of 0.14 € or 4.9% in the year 2007 in relation to the year 2006, while total financial result was reduced for 633.79 € or 10.8%. In the year 2007 production value grew up for 2.59% as well as production expenses for 12.8% in relation to the previous year 2006.

Business indexes analysis

Business index analysis has been done with the aim of comparison between the observed farm and other economy entities, regardless of their extent and production capacity structure.

Analyzed economic business indexes on the farm are: efficiency, production profitability, productivity.

Gained economical production level on the farm has been calculated as the relation between market value and total production expenses, which was 1.76 for the year 2006 and 1.6 for the year 2007.

From the gained economical production coefficients it is evident that the production in both years was economical, although it was gained lower economy in the year 2007.

Gained production profitability rate on the farm is shown as the relation between gained and market production value and amounts to 43.26% for the year 2006, and 37.61% for the year 2007.

Gained working productivity on the farm has been calculated out of relation between gained and spent working hours and amounts to 11.64 €/h for the year 2006, and 10.83 €/h for the year 2007.

In the year 2006, it was gained 11.64 € per every spent working hour of a worker, and 10.83 € for the year 2007.

Besides this gained productivity reduction in the year 2007 in relation to the year 2006 its values were considerably high, which implied good working organization and skillful workers for work performing.

Conclusion

On the basis of calculated and analyzed economic indexes on the observed farm it has been concluded that it ran successful business in both observed years and gained positive financial result, which also has confirmed profitability of walnut seedling production, although it has been set on a small area of the family farm.

Total amount of expenses was increased for 12.8% and total production value for 2.59% in the year 2007 in relation to 2006. It was also gained lower financial result of 10.8%, while financial result per seedling was reduced for 4.9%.

Gained economical production coefficient of 1.76% for the year 2006 and 1.6 for the year 2007 is the proof that the production on the farm is economical.

Gained profitability level is quite good and it was 43.26% in 2006 and 37.61% out of market production value in 2007.

Gained working productivity on the farm amounted to 11.64 € per hour of spent work in the year 2006 and 10.83 € per hour of spent work in the year 2007.

The farm plans to make supply in next period as well as installation of anti-hail equipment (metal construction, network). This will call for extra expenses, but at the same time the farm will be free from high expenses for weather disaster insurance prize.

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