



ANALYSIS OF INCOME, EXPENSES AND PROFIT OF AN AGRICULTURAL ENTERPRISE

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ABSTRACT

The purpose of this study is to determine the degree of efficiency in the production of three main agricultural crops – wheat, corn, and sunflower – through an analysis of income, expenses, and profit. The analysis was conducted based on data from a sole proprietor – a farmer who owns, leases, and rents land. The production activity carried out by him in the 2022–2023 business year is efficient due to lower levels of production costs for obtaining finished products. However, in 2023–2024, the technological cost of wheat production is twice as high, leading to reduced profit.

Keywords: cost, revenues, profits, wheat, corn, sunflower, profit maximization

INTRODUCTION

The present study considers data related to the average yield, purchase price, revenues, and expenses of an agricultural enterprise cultivating wheat, corn, and sunflower, as well as the number of decares of arable land.

In the analysis of the enterprise's production activities, particular emphasis is placed on the examination of revenues, expenses, profits, and production costs. Revenues represent the monetary inflows generated from the sale of produced goods. As such, they encompass all economic costs and the realized profit. In a market economy, revenues are a function of two variables – the price of the goods and the quantities sold.

The implementation of any production process necessitates the expenditure of resources. Expenses are an integral part of the overall functioning of any enterprise. They represent the resources and services used, expressed in monetary terms, which the enterprise utilizes for producing a given volume of output. In essence, production costs are the monetary expression of the investments made in the form of production factors. (1) From an accounting perspective, profit is calculated as the difference

between total revenue and total expenses. Production cost is a component of the value of the product and, therefore, constitutes a part of its price, serving as a basis for its formation. There is a strong interdependence between the cost and the value of production – a reduction in cost leads to a decrease in value, and the cost level is significantly influenced by the prices of inputs such as materials, labor, and other resources.

METHODS

The objective of this study is to analyze the revenues, expenses, profit, and production costs of three main agricultural crops - wheat, corn, and sunflower - based on data from a specific agricultural enterprise, located in the Southeast planning region of Bulgaria over a two-year period (2022–2023 and 2023–2024). And to establish the maximum profit levels in the production of the three crops using the total revenue - total cost and marginal revenue - marginal cost approaches. The goal is to formulate recommendations aimed at enhancing the economic efficiency of production.

RESULTS

Revenue Structure from the Production of Wheat, Corn, and Sunflower

The distribution of revenue across the three main cultivated crops is presented in **Table 1**.

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Table 1. Revenue Structure by Crop and Year (Values in BGN and percentages)

Year	Total		Wheat		Corn		Sunflower	
	BGN	%	BGN	%	BGN	%	BGN	%
2022-2023	5 108 674	100	2 129 149	41,7	1 882 423	36,8	1 097 102	21,5
2023-2024	4 985 982	100	1 629 692	32,7	2 517 498	50,5	838 792	16,8

The analysis of total revenues shows that there is a decrease of 122,692 leva or 2%. For the first year, wheat has the highest relative share of revenues, followed by corn, and the lowest relative share is sunflower. For the second year, there is a change, with corn taking the highest percentage of revenues, followed by wheat and sunflower.

In terms of wheat, there is also a decrease of 499,457 leva or 23%. In 2022 year, the farm grows 5,690 decare of wheat, and in 2023 the areas increase to 6,738. The purchase price of production also increases from 0.47 leva per kilogram in 2023 to 0.51 leva per kilogram in 2024. However, there is a decrease in total revenues, the reason for which is the reduced average yield per decare. In 2023, the average yield of wheat is 804 kilograms per decare, and in 2024 it is 472 kilograms per decare.

The analysis of the data for corn indicates an increase in income by 635,075 leva or 25%. In 2022, the farm grows 3604 decare of corn, and in 2023 the area increases slightly to 3699. The

purchase price of the production also increases from 0.52 leva per kilogram in 2023 to 0.59 leva per kilogram in 2024. In 2023, the average yield of corn is 997 kilograms per decare, and in 2024 it is 1163 kilograms per decare. The combination of the increased average yield and the increased purchase prices leads to an increase in income from the crop.

Regarding sunflower, there is a decrease in revenue by 258,310 leva or 24%. In 2022, the farm grows 4,210 decare of sunflower, and in 2023 the area decreases to 3,076. The purchase price of the production decreases from 1.10 leva per kilogram in 2023 to 1.09 leva per kilogram in 2024. In 2023, the average yield of sunflower is 217 kilograms per decare, and in 2024 it is 249 kilograms per decare. The decrease in revenue is due to the reduced decare sown with sunflower.

Structure and Dynamics of Production Costs
The breakdown of production costs associated with wheat, corn, and sunflower is shown in **Table 2**.

Table 2. Cost Structure for the three crops (in BGN and %)

Year	Total		Salaries, insurance,		Fertilizers		Seeds		Repair and spare parts costs		Pesticides	
	BGN	%	BGN	%	BGN	%	BGN	%	BGN	%	BGN	%
2022-2023	1 514 353	100	370 296	24,45	498 625	32,93	209 353	13,82	191 746	12,66	244 333	16,14
2023-2024	2 216 368	100	539 428	24,33	1 007 757	45,47	246 010	11,1	190 912	8,61	232 261	10,49

The cost analysis reveals an overall increase of 702,015 BGN, or 46%, between the 2022–2023 and 2023–2024 agricultural years.

In the first year, fertilizers constituted the largest proportion of expenses (32.93%), followed by wages and social security contributions (24.45%), plant protection products (16.14%), seeds (13.82%), and repair and spare parts (12.66%).

In 2023–2024, this hierarchy remained relatively stable with fertilizers continuing to represent the highest cost component at 45.47%, indicating a

notable increase. The shares for wages (24.33%) and seeds (11.1%) changed only slightly, while plant protection products and repairs accounted for 10.49% and 8.61%, respectively.

This significant increase in fertilizer-related costs suggests a need for further optimization of input resource management, particularly in the context of rising prices and changing input efficiency.

Cost Structure in Wheat Production

The specific structure of expenses for wheat cultivation is presented in **Table 3**.

Table 3. Cost Structure in Wheat Production (in BGN and %)

Year	Total		Salaries, insurance,		Fertilizers		Seeds		Repair and spare parts costs		Pesticides	
	BGN	%	BGN	%	BGN	%	BGN	%	BGN	%	BGN	%
2022-2023	544 960	100	124 364	22,8	143 816	26,4	69 341	12,73	76 677	14,07	130 762	24
2023-2024	939 675	100	215 329	22,9	385 817	41,06	108 035	11,5	92 888	9,9	137 606	14,64

The analysis of wheat costs shows that there is an increase of 394,715 leva in absolute value, which is 72%. For the first year, the highest relative share of costs is for fertilizers, and the lowest - for seeds. For the second year, the highest relative share of costs is again for

fertilizers, but the lowest is for costs for repairs and spare parts.

Cost Structure in Corn Production

The cost structure associated with the production of corn is summarized in **Table 4**.

Table 4. Cost Structure in Corn Production (in BGN and %)

Year	Total		Salaries, insurance,		Fertilizers		Seeds		Repair and spare parts costs		Pesticides	
	BGN	%	BGN	%	BGN	%	BGN	%	BGN	%	BGN	%
2022-2023	613 574	100	144242	23,5	249 172	40,6	88 765	14,47	53074	8,64	78321	12,78
2023-2024	938 523	100	216987	23,12	483 335	51,5	96 261	10,26	53981	5,75	87959	9,37

For corn, there is also an increase of 324,949 leva in absolute value, which is 53%. For the first year, the highest relative share of costs is for fertilizers, and the lowest is for costs for repairs and spare parts. For the second year, the

first and last places in terms of costs are maintained.

Cost Structure in Sunflower Production

The structure of production expenses related to sunflower cultivation is presented in **Table 5**.

Table 5. Cost Structure in Sunflower Production (in BGN and %)

Year	Total		Salaries, insurance,		Fertilizers		Seeds		Repair and spare parts costs		Pesticides	
	BGN	%	BGN	%	BGN	%	BGN	%	BGN	%	BGN	%
2022- 2023	177 911	100	50 845	28,6	52 819	29,7	25 624	14,4	30 998	17,4	17 625	9,9
2023-2024	169 085	100	53 556	31,7	69 303	41	20 857	12,32	22022	13	3348	1,98

Regarding the costs of sunflower, a decrease of 8,826 leva was observed as an absolute value, which is 5%. For the first year, the highest relative share of costs was for fertilizers, and the

lowest – for plant protection products. For the second year, the situation is the same.

The production cost and the prices of the production are presented in **Table 6**.

Table 6. Production cost and prices of the production in leva/kg

Year	Wheat		Corn		Sunflower	
	BGN/kg	Cost price BGN/kg	BGN /kg	Cost price BGN/kg	BGN /kg	Cost price BGN/kg
2022-2023	0,47	0,23	0,52	0,32	1,10	0,80
2023-2024	0,51	0,54	0,59	0,35	1,09	0,94

It is noticeable that the purchase prices for wheat and corn are increasing, while for sunflower there is a minimal decrease. The cost price for all three crops is increasing.

The amount of profit in the production of the three crops is presented in **Table 7**.

Table 7. Amount of profit in the production, BGN

Year	Wheat	Corn	Sunflower
2022-2023	1 584 189	1 268 849	919 191
2023-2024	690 017	1 578 975	669 707

The data indicate that there is a decrease in the profit from the production of wheat and sunflower, while an increase is observed for corn. In terms of wheat, a decrease of 894,172 leva or 44% is observed. Although the sown areas and the purchase price of the production are increasing, the profit is decreasing due to the increased production costs and the reduced average yield per decare. The analysis of the data for corn indicates an increase in profit by 310,126 leva or 24%. The combination of the increased areas, increased average yield and increased purchase prices leads to an increase in the profit from the crop. In terms of sunflower,

a decrease in the amount of profit is observed by 249,484 leva or 27%. Which is a result of the reduced areas sown with sunflower.

Firm's profit maximization model is one of the fundamental and most extensively studied problems in microeconomics. From a mathematical point of view, profit maximization is an unconstrained optimization problem that is usually solved and analyzed using differential calculus.(2)

Profit maximization in wheat production is presented in **Table 8**.

Table 8. Profit maximization in wheat production

TP (Total product, kg)	P Price (BGN/kg)	TR (Total Revenue, BGN)	TC (Total Costs, BGN)	Profit (BGN)	MR (Marginal Revenue)	MC (Marginal Costs)
4267500	0,47	2005725	2030000	-24275	0,47	
4324400	0,47	2032468	2042000	-9532		0,21
4381300	0,47	2059211	2059211	0	0,47	0,30
4438200	0,47	2085954	2061211	24743		0,03
4495100	0,47	2112697	2070050	42647	0,47	0,16
4552000	0,47	2139440	2078600	60840		0,15
4608900	0,47	2166183	2080183	86000	0,47	0,03
4665800	0,47	2192926	2106986	86000		0,47
4722700	0,47	2219669	2135369	84300	0,47	0,50
4779600	0,47	2246412	2182912	63500		0,84

In the 4267500 - 4324400 kilogram range, profit is negative because aggregate costs are more than aggregate revenues. At the level of 4381300 kilograms, we have zero profit and this is where the critical volume of production (Break event point) is located. In the range of 4438200 to 4552000 kilograms, the profit increases. At levels 4608900 – 4665800 kilograms there is maximum profit. From the level of 4722700 kilograms, the profit starts to decrease.

Profit maximization in corn production is presented in **Table 9**.

In the 3240000 - 3384000 kilogram range, profit is negative because aggregate costs are more than aggregate revenues. At the level of 3384000 kilograms, we have zero profit and this is where the critical volume of production (Break event point) is located. In the range of 3420000 to 3600000 kilograms, the profit increases. At levels 3780000 – 3960000 kilograms there is maximum profit. From the level of 4140000 kilograms, the profit starts to decrease.

Table 9. Profit maximization in corn production

TP (Total product, kg)	P Price (BGN/kg)	TR (Total Revenue, BGN)	TC (Total Costs, BGN)	Profit (BGN)	MR (Marginal Revenue)	MC (Marginal Costs)
3240000	0,52	1684800	1700000	-15200	0,52	
3312000	0,52	1722240	1730000	-7760		0,42
3384000	0,52	1759680	1759680	0	0,52	0,41
3420000	0,52	1778400	1770000	8400		0,29
3528000	0,52	1834560	1800000	34560	0,52	0,28
3600000	0,52	1872000	1832000	40000		0,44
3780000	0,52	1965600	1915600	50000	0,52	0,46
3960000	0,52	2059200	2009200	50000		0,52
4140000	0,52	2152800	2107800	45000	0,52	0,55
4320000	0,52	2246400	2204400	42000		0,54

Profit maximization in sunflower production is presented in **Table 10**.

Table 10. Profit maximization in sunflower production

TP (Total product, kg)	P Price (BGN/kg)	TR (Total Revenue, BGN)	TC (Total Costs, BGN)	Profit (BGN)	MR (Marginal Revenue)	MC (Marginal Costs)
421000	1,10	463100	490000	-26900	1,10	
505200	1,10	555720	580000	-24280		1,07
589400	1,10	648340	648340	0	1,10	0,81
673600	1,10	740960	710000	30960		0,73
757800	1,10	833580	800500	33080	1,10	1,07
842000	1,10	926200	865000	61200		0,77
926200	1,10	1018820	943820	75000	1,10	0,94
1010400	1,10	1111440	1036440	75000		1,10
1094600	1,10	1204060	1134060	70000	1,10	1,16
1178800	1,10	1296680	1229680	67000		1,14

In the 421000 - 505200 kilogram range, profit is negative because aggregate costs are more than aggregate revenues. At the level of 589400 kilograms, we have zero profit and this is where the critical volume of production (Break event point) is located. In the range of 673600 to 842000 kilograms, the profit increases. At levels 926200 – 1010400 kilograms there is maximum profit. From the level of 1094600 kilograms, the profit starts to decrease.

CONCLUSIONS

To maintain the profit from the production of wheat, corn and sunflower, the agricultural enterprise should optimize the use of fertilizers as the largest expense. This could happen by purchasing innovative products with maximum efficiency at lower fertilizer rates, at the most appropriate time in terms of prices (after harvest). As well as by observing agrotechnology - applying fertilizers at the appropriate stage of the crop's vegetation. As a recommendation, it can be stated that the

agricultural enterprise should focus more on the production of corn, allocating larger areas to this cereal crop in order to generate higher profits.

The specified maximization models provide information about the volume of production that the agricultural enterprise should adhere to in order to realize maximum profit. They are valid at the specified price.

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