RESEARCH CONCERNING THE USE OF GROSS MARGIN IN THE PROFITABILITY ANALYSIS IN WHEAT AND BARLEY CROPPING

CERCETARI PRIVIND UTILIZAREA MARJEI BRUTE IN ANALIZA PROFITABILITATII IN CULTURA GRAULUI SI ORZULUI

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Abstract. *The paper aimed to make a comparison between profitability in wheat and barley cropping in a non irrigated system in the South Plain of Romania based on gross margin and profit. The data were collected for the year 2010 from two farms which achieved: Farm 1: 5,800 kg wheat and 5,000 kg barley per ha and Farm 2: 4,500 kg wheat and 4,000 kg barley/ha. Farm 1 carried out a higher profitability for the both crops compared to Farm 2. Its performance was: Lei 2,518/ha gross margin and 47.98 % net profit rate for wheat and Lei 1,741/ha gross margin and 26.77 % net profit rate for barley. As wheat crop is more profitable than barley, farmers have to optimize crop structure in order to improve economic efficiency.*

Key words: *analysis, gross margin, wheat, barley, profitability*

INTRODUCTION

Cereal cropping is an important sector of the Romanian agriculture, as cereals are a basic food both for human being and animals (9). Romania's entry into the EU in January 2007 imposed the acceptance of Gross Margin (GM) as a barometer of economic efficiency for various production directions adopted in a farm (8).

The advantage of GM is the fact that it allows the comparison concerning the profitability between various activities running in a farm and

decide which one produces the highest gross margin and profit (1, 2, 3, 4, 5, 6). Therefore, the higher gross margin per ha, the more profitable crop (7, 8, 9). Also, it could be successfully used as a standard criterium for classifying farms according to their profile and contribution to the overall profit (1).

In the vegetal sector, Gross Margin is calculated in Lei per surface unit and its level depends on output per surface unit but also on variable costs. The practice has proved that the higher production performance and the lower variable costs, the higher gross margin. Subtracting fixed costs from gross margin, we could get gross profit per ha (8).

In this context, this study aimed to make a comparison between the profitability of two basic crops for the Romanian agriculture: wheat and barley. In this purpose, the data were collected from two farms situated in the South Plain of Romania and were processed according to the specific methodology for calculating gross margin and profit.

MATERIALS AND METHODS

The research work aimed to make a comparison between wheat and barley crops from the point of their profitability. In this purpose, gross margin and profit were used as comparison criteria. These indicators were calculated according to the EU regulations, using the formulae:

(a)GM= GP-VC, where GM=Gross Margin, GP= Gross Product and VC=Variable Costs; (b)GP=GM-FC, where GP=Gross Profit, GM=Gross Margin and FC=Fixed Costs; (c)NP =GP-PT, where NP= Net Profit, GP=Gross Profit and PT= Profit Tax.

All the data were collected for the year 2010 from two farms situated in the South Plain of Romania: Farm 1- S.C.Gut SRL and Farm 2- SA Seaca, practicing cereal cropping in a non irrigated system, having similar technical endowment and applying similar agriculture technologies.

The calculations were made into two variants: A Variant- Taking into consideration subsidies and B Variant –No subsidies. Subsidies represent Euro 131 (of which Euro 81 from the EU and Euro 50 from the Romanian Government), calculated at 1 Euro=4.3 lei exchange rate. All the data were expressed in the national currency –Lei per ha.

RESULTS AND DISCUSSIONS

Farm 1

Gross Product was Lei 4,289 for wheat and Lei 3,650/ha for barley, assuring a difference of 17.50 % in the advantage of wheat crop (A Variant). This was due to the average production: 5,800 kg/ha for wheat and 5,000 kg/ha for barley but also to sale price for each grain category (Table 1).

Table 1. Gross Margin and Profit for Wheat and Barley Crops –Farm 1

Lei/ha

Specification	Wheat		Barley	
	A Variant Subsidies included	B Variant No subsidies	A Variant Subsidies included	B Variant No subsidies
Gross Product	4,289	3,739	3,650	3,100
Variable Costs	1,771	1,771	1,909	1,909
Gross Margin	2,518	1,968	1,741	1,191
Fixed Costs	959	959	859	859
Gross Profit	1,559	1,009	882	332
Total Production Costs	2,730	2,730	2,768	2,768
Gross Profit Rate (%)	57.10	36.95	31.86	11.99
Profit Tax (16 %)	249	161	141	53
Net Profit	1,310	848	741	279
Net Profit Rate (%)	47.98	31.06	26.77	10.07

Variable Cost counted for Lei 1,771/ha for wheat and Lei 1,909/ha for barley. Therefore, for producing barley, the expense was by 7.79 % higher compared to wheat cropping even thou barley yield was lower than wheat yield.

Variable cost was mainly influenced by seed and fertilizer cost whose share in total production cost counted for 42.63 %. Seed cost depended on the utilized cultivars, the dose per surface unit and sale price. Fertilization represented Lei 780/ha both for wheat and barley. Also, the both crops needed Lei 37/ha for herbicides, but no fungicides, insecticides,

irrigation water, thirds services, insurance and seasonal labor were used (Table 2).

Fixed Cost counted for Lei 959/ha for wheat and Lei 859/ha for barley. Therefore, fixed cost was by 11.64 % higher in case of wheat, determined by the expense involved in full time labor. The rent was Lei 600/ha for the both crops.

Table 2.Structure of Production Cost per Ha for Wheat and Barley Crops-Farm 1

Specification	Wheat		Barley		Difference Wheat - Barley
	Lei	%	Lei	%	Lei
Variable Costs :	1,771	64.87	1,909	68.96	-138
Seed	384	14.06	522	18.85	-138
Fertilizers	780	28.57	780	28.17	-
Herbicides	37	1.37	37	1.34	-
Fungicides	-	-	-	-	-
Insecticides	-	-	-	-	-
Irrigation Water	-	-	-	-	-
Services by Third Parties	-	-	-	-	-
Insurance	-	-	-	-	-
Own Mechanical Works	570	20.87	570	20.60	-
Seasonal Labor	-	-	-	-	-
Supply Cost	-	-	-	-	-
Fixed Costs:	959	35.13	859	31.04	+100
Full time Labor	300	10.98	200	7.22	+100
General Costs	53	1.98	53	1.91	-
Interest	3	0.10	3	0.12	-
Depreciation	3	0.10	3	0.12	-
Rent	600	21.97	600	21.67	-
Total Production Cost	2,730	100.00	2,768	100.00	-38

Production Cost was Lei 2,730 in case of wheat and Lei 2,768/ha for barley, the difference of Lei 38 being insignificant. Therefore, the main

factors with a deep impact on crop profitability are average production, sale price and variable cost.

In case of wheat, A Variant, including subsidies, the net profit rate was 47.98 % and for B Variant, no subsidies, 31.06 %, showing that subsidies were expected to increase crop profitability.

In case of barley, A Variant, subsidies included, assured 26.77 % net profit rate compared to B Variant, where profit rate was just 10.07 % (Table 1).

Farm 2

Gross Product counted for Lei 3,086/ha for wheat and Lei 2,550/ha for barley. Therefore, in this farm, wheat was also produced more income (Table 3).

Table 3. Gross Margin and Profit for Wheat and Barley Crops –Farm 2

Lei/ha

Specification	Wheat		Barley	
	A Variant Subsidies included	B Variant No subsidies	A Variant Subsidies included	B Variant No subsidies
Gross Product	3,086	2,700	2,550	2,000
Variable Costs	1,486	1,486	1,652	1,652
Gross Margin	1,600	1,214	898	348
Fixed Costs	620	620	190	190
Gross Profit	980	594	708	158
Total Production Costs	2,106	2,106	1,842	1,842
Gross Profit Rate (%)	46.53	28.20	38.43	8.57
Profit Tax (16 %)	157	95	113	25
Net Profit	823	499	595	133
Net Profit Rate (%)	39.07	23.69	32.30	7.22

Variable Cost counted for Lei 1,486/ha for wheat and Lei 1,652/ha for barley. Therefore, barley required by 11.17 % more expense per surface unit compared to wheat crop.

Seed cost represented 11.87 % in case of wheat and 19.54 % in case of barley of total production cost.

Fertilizers were the most expensive technological factor in the both crops, representing 35.61 % for wheat and 33.65 % for barley in total production cost.

In case of Farm 2, the farmer did not spend any money for insecticide, irrigation water, services with thirds and insurance, but barley crop needed herbicides and fungicides. Also, seasonal labor and some supply cost were required influencing variable cost (Table 4).

Table 4. Structure of Production Cost per Ha for Wheat and Barley Crops-Farm 2

Specification	Wheat		Barley		Difference Wheat - Barley
	Lei	%	Lei	%	Lei
Variable Costs :	1,486	70.56	1,652	89.68	-166
Seed	250	11.87	360	19.54	-110
Fertilizers	750	35.61	620	33.65	+130
Herbicides	-	-	180	9.77	-
Fungicides	-	-	12	0.65	-
Insecticides	-	-	-	-	-
Irrigation Water	-	-	-	-	-
Services by Third Parties	-	-	-	-	-
Insurance	-	-	-	-	-
Own Mechanical Works	456	21.65	450	24.42	+6
Seasonal Labor	20	0.94	20	1.08	-
Supply Cost	10	0.49	10	0.57	-
Fixed Costs:	620	29.44	190	10.32	+430
Full time Labor	270	12.82	170	9.22	+100
General Costs	20	0.94	10	0.55	+10
Interest	-	-	-	-	-
Depreciation	30	1.44	10	0.55	+20
Rent	300	14.24	-	-	+300
Total Production Cost	2,106	100.00	1,842	100.00	+264

Fixed Cost reached Lei 620/ha for wheat being by 3.26 times higher compared to fixed cost for barley, which counted just for Lei 190/ha. This

situation was due to the lower cost with full time labor for barley and also due to the lack of rent in case of barley.

Comparing the two farms, the financial results are better in case of Farm 1, where gross margin, gross profit, net profit and profit rate were superior to he records of Farm 2.

Therefore, wheat is a more profitable crop in comparison with barley under the conditions of the Southern Plain of Romania.

CONCLUSIONS

Production is the first major factor with a positive influence on gross margin and profit in a farm.

Wheat could assure a higher gross product compared to barley.

Variable cost is the second main factor with a deep impact on gross margin and crop profitability. It is highly determined by crop technology and every cost item, but mainly by seed and fertilizer cost.

Wheat cropping assured a higher gross margin in comparison with barley cropping.

Gross margin was increased by subsidies got by farmers from the EU and the Romanian government.

As long as wheat is used for producing bread and other food products is still an important crop in the Romanian agriculture. Barley is also important for animal feeding, a reason to continue its cultivation.

The main problems to whom farmers have to pay attention for increasing crop profitability are: crop structure closely linked to crop rotation, cultivars and their production performance as well as their resistance to drought, seed and fertilizer dose for surface unit, crop protection in order to keep under control variable cost.

Gross margin could be successfully used for comparing different crops in order to optimize production and income per surface unit and increase farm profitability and competitiveness.

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