

USE OF COMPUTER-ASSISTED MANAGEMENT FOR -MAKING STRATEGIC DECISIONS IN THE AGRICULTURAL FARMS

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Abstract

For a business to be effective it must be well organized, must use software programmes to provide data on the evolution of the activity at any time, use advanced software to facilitate work in agricultural farms and increase its productivity. The main purpose of MBS determining is in comparing the size on geographical areas, making a uniform classification of agricultural farms, in order to determine the economic size and technical-economic orientation of the farm. To calculate the standard gross margin in the SC Agricola Frugal SRL agricultural farm we took into account the average yields per hectare for each crop, marketing value of each product and variable expenses involved in the production process and that change during the process according to the value of production. In the SC Agricola Frugal SRL agricultural farm the standard gross margin increased significantly during the three periods, thus to 4,827,177 lei recorded in Present, to record an increase of 106.20% reaching 9,554,060 in Objective period.

Key words: MBS, agricultural management, strategic decisions, farms

It is now widely accepted that computer science is an important source for modern agriculture. Computer development offers farmers the opportunity to quickly obtain technical and economic information and effective use of their decision-making on future strategies that society will take.

MATERIAL AND METHOD

To achieve his work we used the case study as major research strategy and in the analysis of company's level of performance we used the model of determination the Standard Gross Margin realized in Excel worksheets. For data collection and analysis we used tools specific to qualitative research and internal documents, technological records and discussions with managers SC Agricola Frugal SRL.

RESULTS AND DISCUSSIONS

The agricultural companies wishing to become or remain competitive need financial, material, human and not least information resources.

For a business to be effective it must be well organized, use the software programmes that provide data at any time on the evolution of this activity, use advanced software to facilitate work in agricultural farms and increase its productivity.

By using software programmes in the farms the working time for collecting, processing and obtaining results is reduced.

S.C. Agricola Frugal SRL was founded in 2005 on the skeleton of another farm, SC Frugal SA and its registered office is located in Dorohoi, Botosani county.

The main activity of the company according to CAEN code is "The cultivation of vegetables and melons, root and tuber plants". The society in addition to the main activity has recorded two secondary activities CAEN code 0111 "Growing of cereals, leguminous and oil seed plants" and CAEN code 5121 "Wholesale and retail of various agricultural products."

At present, the company has numerous locations for farm crop (grain and vegetable storage warehouses), machinery and agricultural equipment for the smooth conduct of the business. S.C. Agricola Frugal SRL has now 34 employees, of which 14 employees on undetermined period and 20 fix-term employees. The company uses daily workers during the campaigns. The percentage of persons with superior studies is 14.28% of all employees, hence the training is quite high. S.C. Agricola Frugal SRL commercial company uses especially the young, so it recorded increased productivity. From 2005 until now the company has increased the cultivated area of 80 hectares as held in 2005 to 300 ha in 2010.

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Structure on cultures of SC Agricola Frugal SRL farm is shown in figure 1.

From figure 1 we can see that SC Agricola Frugal SRL farm cultivates 22% of the area with potato, winter wheat – 15% and onions - 13%. The cultures that have the lowest share are pepper 4%.

The basic principles and rules for calculating the standard gross margins (MBS) are set out in Annex. 1 in the Commission Decision of 07 85/377/33CEE June 1985, establishing a Community typology for agricultural farms (OJ no. L220, 17.08.1985) and still in force.

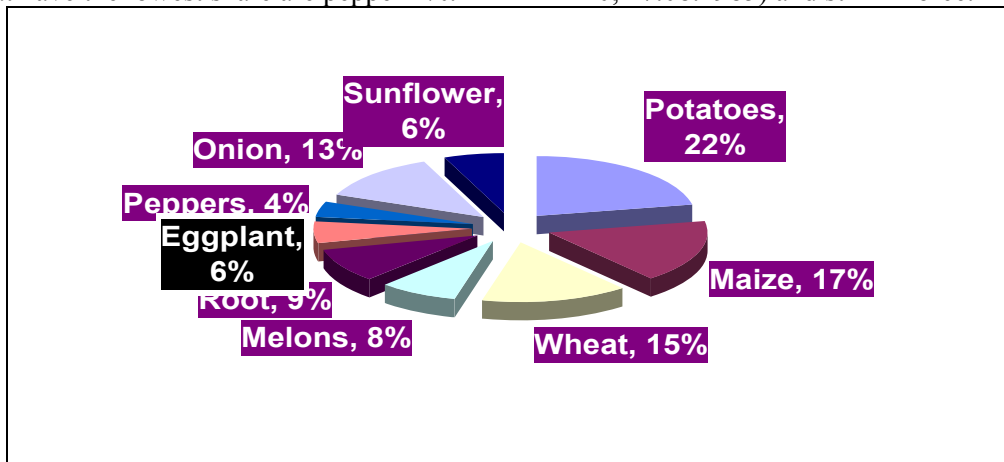


Figure 1 Share of crops in 2010

Standard gross margin is an economic concept of major importance used in structural and technical-economic analyses of the farms.

The main purpose of determining the MBS size is to compare its size on geographical areas, make a uniform classification of agricultural farms, in determining the economic size and technical-economic orientation of the farms.

Standard gross margin (SGM) of an agricultural activity (crops or animal species) means the gross product of the activity in question minus the corresponding specific costs. Gross product value is represented by the value of primary and secondary production, plus subsidies from the state. Variable costs are considered those that vary according to output.

To determine the standard gross margin in the SC Agricola Frugal SRL agricultural farm was

used as basis the Microsoft Office software work with Microsoft Excel, where, based on sets of mathematical formulas we could calculate the standard gross margin during the current, objective and optimized period.

To calculate the standard gross margin in the agricultural farm SC Agricola Frugal SRL have been taken into account average yields per hectare for each crop, marketing value of each product and variable expenses involved in the production process that changes during the process according to the value of production.

Regarding the consumption of raw materials and material these were represented by the costs of seed, fertilizers, plant protection, mechanization costs and other expenses incurred in storage, transport, handling and packaging of its production (fig. 2).

Directii de productie			Productie						Cheltuieli variabile								Marja	Necesarul de factori		Productia furajera	
Marker	Cod	Denumire (Servicii externe/secerat)	u.m	Productie principala		Prod. secund.	Plati directe	Productie totala	Samanta	Ingrasa-minte	Protectia plantelor	CV mecaniz.	Servicii	Alte CV	CV in total	Marja bruta	Necesarul de factori circ.	Munca de lucru	Productia furajera de baza		
				Productivitate t/ha	Pret RON/t														Prod. princ. RON/ha	RON/ha	RON/ha
	1001	Grâu	ha	3	1200.00	4,200	30	524	4,754	320	569	229	1,308	150	127	2,703	2,051	1,352	17.0		
	1002	Porumb boabe	ha	5	1300.00	6,500	50	524	7,074	180	491	249	1,402	150	200	2,672	4,402	1,336	17.0		
	1003	Cartofi	ha	17	1700.00	28,900	0	524	29,424	2,800	980	250	1,493	150	194	5,867	23,557	3,520	17.0		
	1004	Floarea soarelui	ha	18	1600.00	4,000	0	524	4,524	184	156	128	1,029	150	64	1,711	2,813	856	17.0		
	1005	Ceapă	ha	17	1400.00	23,800	0	524	24,324	3,000	167	145	1,147	150	61	4,670	19,654	2,802	17.0		
	1006	Ardeioase	ha	17	2200.00	37,400	0	524	37,924	60	310	160	1,087	150	150	1,917	36,007	1,150	17.0		
	1007	Vinete	ha	18	2500.00	45,000	0	524	45,524	410	159	159	1,295	150	115	2,288	43,236	1,373	17.0		
	1008	Rădăcinoase	ha	16	700.00	9,600	0	524	10,124	405	157	149	1,120	150	95	2,076	8,048	1,246	17.0		
	1009	Peperi verzi	ha	18	500.00	9,000	0	524	9,524	760	271	198	1,097	150	151	2,647	6,877	1,588	17.0		
	1012	Porumb optimizat	ha	6	1300.00	7,800	45	524	8,369	180	418	166	1,457	150	182	2,553	5,816	1,277	17.0		
	1013	Grau optimizat	ha	5	1200.00	6,000	35	524	6,559	320	450	126	1,251	150	126	2,423	4,136	1,454	17.0		
	1014																				

Figure 2 Gross margin in vegetal production

Figure 2 shows that the highest value of gross margin per hectare of crop plants with a record 43 236 lei / ha, and the highest value recorded revenues of 45.524 lei / ha.

Gross margin situation in "Present" presents a clear picture of crop farm owned by SC Agricola Frugal SRL and variable costs and revenues for each crop in hand, so farm on basis of these reports can see which crops are efficient and to which to give up the following year.

In the Present value of total gross margin is 4,827,177 lei, resulting in gross margin per hectare of 16,090 lei. The level of total income in this situation is 5,870,486 lei and expenditures of 1,043,309 lei. The culture that registers the highest value of gross margin is potato 1,531,205 lei, and the smallest is held by sunflower with 52,647 lei.

Gross margin value is influenced by total revenue, area variable costs of crops and where it is analyzed.

Unitatea/Ferma "Actual"

Cultura plantelor			Productia					Cheltuieli variabile (CV)							Marja	Neces.de factori	Prod./uraj		
Directii de productie			Productia principala		Productia secund.	Subventii	Productia totala	Samanta	Ingra-	Protectia	CV	Servicii	Alte CV	Total CV	Bruta	Neces. Mij.circ.	Munca ore de	de baza	
Cod	Dimens.	u.m.	Denumire	Recolta t	Pret RON/t	Productia RON	RON	RON	RON	RON	RON	RON	RON	RON	RON	RON	RON	100 MJ	
1001	45 ha		Grâu	157	1,200.00	188,400	1,350	23,580	213,330	14,400	25,605	10,305	58,860	6,750	5,715	121,635	91,695	60,818	765
1002	51 ha		Porumb boabe	255	1,300.00	331,500	2,550	26,724	360,774	9,180	25,041	12,699	71,502	7,650	10,200	136,272	224,502	68,136	867
1003	65 ha		Cartofi	1,105	1,700.00	1,878,500		34,060	1,912,560	182,000	63,700	16,250	97,045	9,750	12,810	381,355	1,531,205	228,813	1,105
1004	300 ha		Suma			5,706,400	3,900	160,186	5,870,486	369,626	141,127	60,632	385,712	44,670	41,542	1,043,309	4,827,177	584,331	4,913

Figure 3 Gross margin in the Present situation

Total Marja Bruta*)		4,827,177
+	Alte venituri/agricole,plati de transfer, etc pe an	0
-	Cheltuieli fixe si cheltuieli generale aproximative pe an	149,197
=	Venituri din exploatare	4,677,980
-	Cheltuieli salariale(incl. cheltuieli suplimentare)pe an	326,400
=	Venitul brut	4,351,580
-	Cheltuieli cu dobanda pe an	76,150
+	Venut din dobanda/an	0
-	Cheltuieli cu arendarea si inchir. cladiri/an	116,000
+	Venituri din arendari si inchirieri/an	0
=	Profitul din exploatare (fara impozitare)	4,159,430

*)Salarile, dobanzile ,arendarile nu sunt scazute!

Aproximarea cheltuielilor fixe si cheltuielilor totale in unitatea,"Actual"		
Amortizari(pt.cladiri,masini,contingente, etc.)		15,095
Cheltuieli generale variabile,	Servicii,servicii externe, inchirieri de masini	9,810
ata timp cat nu	Intrtinere masini, reparaturi	36,981
au fost luate in consider.	Substante de ungere	9,142
in MB	Energie, Caldura, Apa	21,935
Intrtinere cladiri		15,392
Asigurari in general		4,093
Impozitele si taxele unitativa (fara impozitul pe venit)		8,710
Contributii la asociatiile agricole		2,910
Alte cheltuieli ale unitatii		25,129
Suma cheltuielilor fixe si a cheltuielilor generale		149,197

Figure 4 The operating profit in the Present situation

In the Present situation we noticed that gross margin recorded a value of 4,827,177 lei, the total fixed costs are 149,197 lei, hence there result an income from exploitation of 4,351,580 lei and the value of 4.15943 million lei in operating profit.

Gross margin situation "Optimized" can be further improved by leasing an area of 140 ha (fig.5).

From figure 5 it can be seen that the surface optimized of an agricultural farm is of 440 ha, with 37.66% higher than the Present period. Cultures that have significantly increased the area are those of eggplants with more than 39 hectares in the Present period, onions with 13 hectares and peppers with 12 hectares.

Unitatea/Ferma "Optimizata"

Cultura plantelor			Productia					Cheltuieli variabile (CV)							Marja	Neces.de factori	Prod./uraj		
Directii de productie			Productia principala		Productia secund.	Subventii	Productia totala	Inloc. efectiv	Fura/Conc	Medic vet	CV	Servicii	Alte CV	Total CV	bruta	Neces. Mij.circ.	Munca ore de	de baza	
Cod	Dimens.	u.m.	Denumire	Productia Buc.kg	Pret RON/kg	Productia RON	RON	RON	RON	RON	RON	RON	RON	RON	RON	RON	RON	100 MJ	
1008	30 ha		Rădăcinoase	480	700.00	336,000	15,720	351,720	12,150	4,710	4,470	33,600	4,500	2,850	62,280	289,440	37,368	510	
1012	78 ha		Porumb optimizat	468	1,300.00	608,400	3,510	40,872	652,782	14,040	32,604	12,948	113,646	11,700	14,196	199,134	453,648	99,567	1,326
1009	39 ha		Pepeii verzi	702	500.00	351,000		20,436	371,436	30,420	10,569	7,722	42,783	5,850	5,889	103,233	268,203	61,940	663
1013	90 ha		Grâu optimizat	450	1,200.00	540,000	3,150	47,160	590,310	28,800	40,500	11,340	112,590	13,500	11,340	218,070	372,240	130,842	1,530
1003	70 ha		Cartofi	1,190	1,700.00	2,023,000		36,680	2,059,680	196,000	68,800	17,500	104,510	10,500	13,500	410,690	1,646,990	246,414	1,190
1005	54 ha		Ceapă	918	1,400.00	1,285,200		23,296	1,313,496	162,000	9,018	7,830	61,938	6,100	3,294	259,180	1,061,316	151,308	918
1006	23 ha		Ardeioase	391	2,200.00	860,200		12,052	872,252	1,380	7,130	3,680	25,001	3,450	3,450	44,091	828,167		
1007	56 ha		Vinete	1,008	2,500.00	2,520,000		29,344	2,549,344	22,960	8,904	8,904	72,520	8,400	6,440	128,128	2,421,216	76,877	952
440 ha			Suma			8,523,800	6,680	230,560	8,761,020	467,750	182,035	74,394	566,588	66,000	61,039	1,417,806	7,343,214	804,316	7,089

Creșterea animalelor			Productia					Cheltuieli variabile (CV)							Marja	Neces.de factori	Nec. fur	
Directii de productie			Productia principala		Productia secund.	Subventii	Productia totala	Inloc. efectiv	Fura/Conc	Medic vet	CV	Servicii	Alte CV	Total CV	bruta	Neces. Mij.circ.	Munca ore de	de baza
Cod	Dimens.	u.m.	Denumire	Productia Buc.kg	Pret RON/kg	Productia RON	RON	RON	RON	RON	RON	RON	RON	RON	RON	RON	RON	100 MJ
1001																		
1002																		
			Suma															
															Corectura		2 RON	
Plante - Animale in total																		
Modificare fata de „Actual”																		

Figure 5 Gross margin in "Optimized" situation

At this stage the gross margin increased by 52.18% compared to the *Present* period. This increase was due to areas which are planted with eggplants, peppers and onions that record high production per hectare, higher selling prices

compared to other cultures and the production costs are relatively small (fig. 6).

Seen from figure 6 that the additional gross margin to the *Present* period is 2,316,630, with 52.18% higher than the *Present* period, and interest on additional capital used is 210.4%.

Unitatea/Ferma "Optimizata"	Stergeti formularul	Introduceti randuri	Indeparati randuri	Modif.MB	Lista alegere										
Modificare fata de „Actual”		2,817,400	2,760	70,374	2,890,534	98,124	40,908	13,762	180,876	21,330	19,497	374,497	2,516,037	219,986	2,176
Total Marja Bruta															7,343,214
± Modificarea dobanzii pt. animale si mijl.circ.	219,986 RON	10%													-21,999
± Modificari salariale/pt. forta de munca proprie	2,176 AKh	8 RON/h													-17,408
± Modificarea cheltuielilor cu arendarea teren. arabil	400 ha	400 RON/ha													-160,000
± Modificarea cheltuielilor cu arendarea pajstilor	ha	RON/ha													0
± Modificarea amortizariilor pt. mijloace fixe, drepturi															0
± Modificarea dobanzii pt. mijloace fixe	0 RON	19%													0
± Alte modificari ale mijloacelor fixe															0
±															0
±															0
= Marja bruta de comparare (MBC)															7,143,807
=> MBC suplimentar, fata de unitatea „Actual” (=Profitul suplimentar al unitatii)															+2,316,630
Calcularea dobanzii pt. capitalul supl. folosit	2,338,629 / 219,986 =														+210.4%

Investitii suplimentare necesare pt. mijloace imobiliare, drepturi								
Denumire	Costuri de achizitie	Valoarea reziduala	Durata de exploatare	Alte chelt. % din CAch	Amort. (A-V)/D	Alte chelt. (A+V)/D	Mijl. fixe (A+V)/D	
	RON	RON	ani		RON	RON	RON	
Total								

Figure 6 Change in gross margin *Optimized to Present*

During the *objective* period, the standard gross margin registers a value of 9,9954,053 lei and cultures that present the highest standard gross margin are the eggplants with 3,458,880 lei, peppers with 1,813,756 lei and potato with 1,690,845 lei.

Present period. In the *Objective* period SC Agricola Frugal SRL farm wants to use a total area of 600 hectares, with 36.36% higher compared to the *Optimized* period and 100% higher compared to the *Present* period.

From figure 7 we can see that the value of gross margin increased by 35.55% compared to the *Optimized* and by 106.20% compared to the

Additional farm income of SC Agricola Frugal SRL to the current period is 4,726,060 lei and 22,221 lei in comparison with *Optimized*.

Unitatea/Ferma "Obiectiv"	Stergeti formularul	Introduceti randuri	Indeparati randuri	Modif.MB	Lista alegere												
Cultura plantelor																	
Directii de productie		Productia		Cheltuieli variabile (CV)						Marja Bruta	Necesa. de factori	Produsul					
Cod Dimens. u.m. Denumire	Recolta t	Pret RON/t	Productia RON	Productia secund. RON	Subventii RON	Productia totala RON	Samanta RON	Ingra-saminte RON	Protectia plantelor RON	CV mecaniz. RON	CV Servicii RON	Alte CV RON	Total CV RON	Marja Bruta RON	Necesa. Mijl. circ. RON	Munca ore de lucru	de baza 100 MJ NEL
1012 70 ha Porumb optimizat	420	1,300.00	546,000	3,150	36,680	585,830	12,600	29,260	11,620	101,990	10,500	12,740	178,710	407,120	89,355	1,190	
1002 59 ha Porumb boabe	295	1,300.00	383,500	2,950	30,916	417,366	10,620	28,969	14,691	82,718	8,850	11,800	157,648	259,718	78,824	1,003	
1013 90 ha Grau optimizat	450	1,200.00	540,000	3,150	47,160	590,310	28,800	40,500	11,340	112,590	13,500	11,340	218,070	372,240	130,842	1,530	
1004 65 ha Cartofi	1,105	1,600.00	1,768,000		34,060	1,802,060	11,960	10,140	8,320	66,885	9,750	4,160	111,215	1,690,845	55,608	1,105	
1005 72 ha Cespă	1,224	1,400.00	1,713,600		37,728	1,751,328	216,000	12,024	10,440	82,584	10,800	4,392	336,240	1,415,088	201,744	1,224	
1006 86 ha Ardeiase	850	2,200.00	1,870,000		30,200	1,900,200	2,500	11,894	6,700	54,350	6,000	5,000	86,444	1,813,756			
1007 80 ha Vinețe	1,440	2,500.00	3,600,000		41,920	3,641,920	32,800	12,720	12,720	103,600	12,000	9,200	183,040	3,458,880	109,824	1,360	
1009 78 ha Pepeni verzi	1,404	500.00	702,000		40,872	742,872	60,840	21,138	15,444	85,566	11,700	11,778	206,466	536,406	123,880	1,326	
600 ha Suma			11,123,100	9,250	299,536	11,431,886	376,120	166,645	91,275	690,283	83,100	70,410	1,477,833	9,954,053	790,076	8,738	
Cresterea animalelor														Marja Bruta	Necesa. de factori	Nec. fur.	
Directii de productie		Productia		Cheltuieli variabile (CV)						Marja Bruta	Necesa. de factori	Nec. fur.					
Cod Dimens. u.m. Denumire	Productia Buc. kg	Pret RON/kg	Productia RON	Productia secund. RON	Subventii RON	Productia totala RON	Inloc. efectiv RON	Furaj/Cono. RON	Medic. vet. RON	CV mecaniz. RON	CV Servicii RON	Alte CV RON	Total CV RON	Marja Bruta RON	Necesa. Mijl. circ. RON	Munca ore de lucru	de baza 100 MJ NEL
Suma																	
Plante + Animale in total			11,123,100	9,250	299,536	11,431,886	376,120	166,645	91,275	690,283	83,100	70,410	1,477,833	9,954,053	790,076	8,738	
Modificare fata de „Actual”			5,416,700	5,350	139,350	5,561,400	6,494	25,518	30,643	304,571	38,430	28,868	434,524	5,126,876	205,746	3,825	

Figure 7 Gross margin in "Objective"

Investitii suplimentare necesare pt. mijloace imobiliare, drepturi														
Denumire	Costuri de achizitie	Valoarea reziduala	Durata de exploatare	Alte chelt. % din CAch	Amort. (A-V)/D	Alte chelt. (A+V)/D	Mijl. fixe (A+V)/D							
	RON	RON	ani		RON	RON	RON							
Tractor Same Deutz	140369	14209	20	2.0%	178,294	2,807	77,289							
Combină Gloria C14	17091	3691	20	2.0%	670	342	10,391							
Motopompă pentru irigar	126169	1094	20	2.0%	6,254	2,523	63,632							
Total					185,218	5,673	151,312							

Figure 8 Change of gross margin in Objective in comparison with Present and Optimized

CONCLUSIONS

Gross margin is a standard economic concept of major importance and of great topicality used in structural analysis and technical-economic farms. Standard gross margin allows both the comparison of individual activities within a farm, and comparison between different farm activities. In the SC Agricola Frugal SRL farm, the standard gross margin increased significantly during the three periods, thus from 4,827,177 lei that was recorded in Present to record an increase of 106.20% reaching 9,554,060 in Objective period.

In the SC Agricola Frugal SRL farm, the implementation of computer-aided management has many advantages such as making technical-economic analysis faster and release of solutions in very short time, reducing processing costs, creating a database with information farm to reduce the storage space.

SC Agricola Frugal SRL farm should maintain or increase the areas planted with eggplant, peppers and onions, which although quite lifting costs have recorded high productivity per hectare is 17000-18000 kg / ha and that have prices between 1.4 and 2.5 lei / kg.

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