THE OPTIMIZING OF THE MANAGERIAL DECISION ASSISTED BY THE COMPUTER IN ORDER TO ACHIEVE THE OBJECTIVES OF S.C. COTNARI S.A.

OPTIMIZAREA DECIZIEI MANAGERIALE ASISTATĂ DE CALCULATOR PENTRU ÎNDEPLINIREA OBIECTIVELOR LA S.C. COTNARI S.A.

UNGUREANU G., POP CECILIA[1], GRIGORE AURICA[2]
[1]U.S.A.M.V. Iaşi, [2]Universitatea „Danubius'' Galaţi

Abstract. *The approach of this work started with the analysis of the present conditions to the early past ones, from where we came back again to the present and we planned, as much as possible for these times, the future. At the basis of the documentation stayed a part of the works dedicated to management, economy in general, to vineyard, wine, locality and wine-growing region from the area. The information processing, a quite complex process, which cannot be exclusively computerized, no matter how sophisticated the utilized technique would be, has as result solutions that can be decisions, ideas and attitudes.*

Rezumat. *Demersul acestei lucr ări a pornit de la analiza stărilor prezente spre trecutul indep ărtat, de unde neam intors iar ăşi la prezent şi am privit, atât cât ne-au permis aceste vremuri, spre perspectiv ă.La baza document ării au stat o parte din lucrările cons acrate managementului, economiei în general, viei, vinului, localit ăţiişi podgoriei din aceast ă zonă.Din prelucrarea informaţiilor, proces destul de complex, ce nu poate fi l ăsat doar pe seama calculatorului, oricât de rafinată ar fi tehnica utilizat ă, rezult ă soluţii care pot fi decizii, idei sau atitudini.*

SC Cotnari SA was founded in 1991 through the transformation of the former State Agricultural Industrial Unit Cotnari into HG 266/1991. The new founded society took ever the patrimony of the former IAS Cotnari, having as stockholders. The Fund of State Property, Fund of Private Property II Moldova (current SIF II Moldova) and the farmer land owners according to the Law 18/1991, which posses a surface of approximately 800 ha.

This favourable surface is limited to about 1800 ha, out of which, at the moment, more than 1200 ha is administered by SC Cotnari SA.

SC Cotnari SA is a Romanian juridical person with total private capital, having the juridical form of society on stock. The main department of the society is locality Cotnari, Iaşi County. The Society possesses vineyards in Cotnari, Ceplenița, Scobinți and Balş localities.

When founded, the society had a social state capital of 215500000 lei, and now it has a sum of 11.3 billion lei and it is divided in a number of 412531 stocks.

The main objective of activity is to produce and market an internal and international scale of grapes for wine, grapes for eating and wine.

The organizatorial structure corresponds to the present necessities concerning the management and control of production economic and commercial services. In the coming period of time we estimate as necessity the continuous development of commercial and marketing departments.

Using the criteria size of social capital, number of employs value of fixed means and rate of sales, SC Cotnari SA is part of big society's category.

In order to estimate, the general economic state of SC Cotnari SA we look into consideration the evolution the rate of sales, the financial administration and the utilization of material resources during the last four years.

The mathematical shaping – the economic mathematical method used in optimizing the production processes

The production potential of agricultural exploitations is similar with the result which can be achieved through the modification of resource potential technologically balanced conditioned by the functioning of the production process at standard technique-economic level.

Regarding the mathematical shaping, the satisfactory results are obtained through the models elaborated in the limits of living programming. Thus, as part of a model of optimizing the production structure, through the purpose function centred on maximizing the value of the rate of sales, of income or of profit, founds its representation through the direct proportionally, relation between the level of development of different branches and the result of production activity which characterizes the size of production potential.

The restrictions of the model colligate the consumption of material, financial and human means, on categories of resources. Thus, the discrepancies which exist in the specific consumption of resources expressed in technical-economic terms of model, conjugated with the difference of relative efficiency of different activities, had to their dimensioning, and on this basis, to the structuring of the system of agricultural exploitation production in such a way so that it be able to ensure the maximization of the result which can be obtained, in other words, to establishment of the maximum production potential.

RESULTS AND DISCUSSIONS

The results obtained by applying the mathematical model reflect the most favourable result established in certain limits and conditions set by the foreseen restrictions.

As we above mentioned, the optimizing offers infinity of solutions starting with the diversity of conditions and resources. If any of these conditions or restrictions is changed, the obtained result will be different.

That is why we specify that the estimation of the most favourable mathematical result that can be obtained is done only in the context of conditions, restrictions and the pursued objective presented above.

The results obtained by applying the mathematical model were written down with R, and the results obtained through tests with Ro. Then there were presented the minimum results (Ro_{MIN}) and the maximum results (Ro_{MAX}) in each system hours/ha, direct costs, costs of production and profit.

In table 1 are presented the results of optimizing (R_1) at medium production compared to the other results of tests (Ro_{MIN} and Ro_{MAX}).

Table 1

Results of optimizing the medium grape production (kg/ha)

Nr. ctr.	System	Average production			
		R_0		R_1	Closing variants R_{0MAX}
		Var.	Minim Maxim	Optim	
1	ON	3P E+1P	12500 13870	14557	6P=13750 5P=13650
2	ID	3P 6P	9830 10860	10742	5P=10560 E+1P=10220
3	E	3P 5P	12180 13680	13877	6P=13500 E+1P=13350
4	ON/ID	3P 6P	11070 11970	12682	E+1P=11880 5P=11720
5	ON/E	E 6P	11550 13270	13173	5P=13120 4P=12370
6	ID/E	3P 6P	10960 12750	13152	E+1P=12420 5P=12130

Where: P= breeding, E=erbiciding

In ON system, the best production is 14557 kg/ha, and in testing Ro_{MIN} = 12500 kg/ha at alternative 3P, and Ro_{MAX}= 13870 kg/ha at alternative E + 1P.

Alternatives 5P and 6P are close of Ro_{MAX}. This favourable result was imposed by the colligation with the other indicators that have high values: direct costs/ha , labour consumption, the maximizing of production being necessary in order to obtain the maximum profit which are also optimizing criteria.

Similar situations were recorded in systems E, ON/ID and ID/E. In the other systems ID and ON/E, the best production is lower than the maximum production recorded in the testing phase. Thus, in system ID, the best result is 10742 kg/ha, and the maximum obtained is 10680 kg/ha.

In table 2 are presented the results of price optimizing.

It was concluded that in systems ON and ID, the best price is found in the limits of the prices achieved through the tests. If in ON only one alternative (3P) has Ro_{MAX}, higher than R_1, and 4P is close to R_1 in ID system, two alternatives (3Pand 4P) are $Ro_{MAX,}$ higher than R, but the alternative 5P virtually equals R_1. In the other four systems: E, ON/ID, ON/E and ID/E, the best price is 3.7-6.6 higher than Ro_{MAX}, making it necessary to increase the quality of production.

In table 3 are represented the results of optimizing in direct costs/ha, taking as objective their minimizing.

Table.2

Results of utilization price optimizing (lei/kg)

Nr. ctr.	System	Price of valorising			
		R_0		R_1	Closing variants R_{0MAX}
		Var.	Minim Maxim	Optim	
1	ON	6P 3P	4900 5200	5179	4P=5100
2	ID	6P 3-4P	5300 5600	5518	5P=5500
3	E	6P 3P	5000 5300	5463	4P=5200
4	ON/ID	6P,E+1P 3P,E	5000 5300	5427	4-5P=5200
5	ON/E	5-6P E	5000 5300	5417	3P,4P,E+1P=5200
6	ID/E	6P 3P	5100 5400	5492	4P, E=5300

Table 3

Results of direct costs optimizing (thousands lei/ha)

Nr. ctr.	System	Cheltuieli directe			
		R_0		R_1	Closing variants R_{0MIN}
		Var.	Minim Maxim	Optim	
1	ON	E 6P	25686 26761	24674	3P=25866 E+1P=25999
2	ID	E 6P	25013 26111	23541	E+1P=25249 3P=25299
3	E	E 6P	26089 27146	24203	3P=26243 E+1P=26348
4	ON/ID	E 6P	25280 26412	24071	3P=25555 E+1P=25601
5	ON/E	E 6P	25717 26908	24328	E+1P=25985 3P=26035
6	ID/E	E 6P	25545 26651	23786	3P=25756 E+1P=26043 4P=26046

The table shows that in all the systems, the most favourable result (R_1) is 13,3% lower than Ro_{MIN}. The alternative with lowest costs was E, in all systems and close values were recorded at alternative E + 1P and 3P.

Optimizing the cost of production expressed in lei/kg is presented in table 4 and contains the effects of production level as well as those of costs.

The results obtained show that the best cost of production is under the level of those realized in all systems. It is noticed the fact that in ON, the most favourable result

is 3409 lei/kg and very close to Ro_{MIN}, 3442 lei/kg realized in alternative E + 1P and also in systems ON/ID and ON/E.

Table 4

Results of optimizing the cost of production expressed in lei/kg

Nr. ctr.	System	Cost of production			
		R_0		R_1	Closing variants R_{0MIN}
		Var.	Minim Maxim	Optim	
1	ON	E+1P 3P	3442 3586	3409	E=3474 5P=3511
2	ID	6P 3P	3854 3945	3631	E+1P=3865 5P=3873
3	E	E 3P	3525 3667	3467	E+1P=3531 5P=3546
4	ON/ID	E+1P 3P	3641 3756	3592	E=3689 6P=3714
5	ON/E	5P E	3584 3701	3530	6P=3592 E+1P=3635
6	ID/E	E 3P	3612 3797	3494	E+1P=3614 6P=3632

The most important indicator, the profit is presented in table 5 in optimized alternative (R_1) and in alternatives minimum and maximum in each system.

Table 5

Results of optimizing the profit (lei/ha)

Nr. ctr.	Sistemul	Profit			
		R_0		R_1	Closing variants R_{0MAX}
		Var.	Minim Maxim	Optim	
1	ON	6P E+1P	15174 17742	18106	3P=17668 4P=17647
2	ID	6P 4P	14840 16962	16743	5P=16615 3P=6432
3	E	6P 4P	15568 17855	18073	3P=17718 E+1P=17600
4	ON/ID	6P E+1P	13425 16913	16352	3P=16018
5	ON/E	6P E	15405 16919	17330	E+1P=16903 4P=16854
6	ID/E	4P E	15956 18284	17672	E+1P=17271

Even if it was thought that the maximizing of the profit will come from systems ID, ON/ID and ID/E, the optimized profit is under the limits of the maximum achieved (Ro_{MAX}), and the other three systems ON, E and PN/E is higher than $Ro_{MAX.}$ The alternatives with the lowest profit were E + 1P in ON and ON/ID systems, E in systems ON/E and ID/E, 4 P in system ID and E.

CONCLUSIONS

The conclusion is that the alternatives with five and six weeding, even if the present few better indicators, on the whole they have the lowest profit.

An example is the case of system ON/ID where the minimum profit (Ro_{MIN}) obtained in alternative 6P is less than 50% out of the maximum profit (Ro_{MAX}) obtained in alternative E + 1P.

It is noticed the fact that exists a colligation of the results established experimentally and the optimized results which proves that both ways of analysis led to close results, underlining the most efficient or most favourable ones.

Regarding the maintenance of the soil, the choice of the most efficient one depends on the conditions specific to the region.

Thus, it was tried a multifactorial analysis of five systems of soil maintenance, each having seven alternatives that could offer to those interested sufficient information in choosing the one which corresponds the best to the conditions in the region and the pursued objective.

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