The optimizing of the managerial decision assisted by the computer in order to achieve the objectives of S.C. COTNARI S.A.

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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.

Key words: decision, assisted, computer, objectives, optimizing, maximizing of profit

1. Introduction

S.C. Cotnari S.A. was founded in 1991 through the transformation of the former State Agricultural Industrial Unit Cotnari by the Government Decision 266/1991. The new founded company took ever the patrimony of the former I.A.S. Cotnari, having as stockholders: the Fund of State Property, the Fund of Private Property II Moldova (actually SIF II Moldova) and the farmer land owners according to the Law 18/1991, which had in possession 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 the company S.C. Cotnari S.A.

S.C. Cotnari S.A. is a Romanian juridical person with total private capital and having the juridical form of a society on stock. The main department of the company is in Cotnari locality from Iasi County. The company possesses vineyards in Cotnari, Ceplenita, Scobinti and Bals localities. (3).

When founded, the society had a social state capital of 215.500.000 ROL, and at present it has a capital of 11.3 billion ROL, which are divided by 412.531 stocks.

The main objective of its activity is to produce and market at internal and international scale the wine grape varieties, table grapes varieties 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 necessary 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, the company S.C. Cotnari S.A. is part of the big society's category.

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

2. Materials and Method

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

The production potential of agricultural exploitations is similar to 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. (3).

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 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 would be able to ensure the maximization of the result which can be obtained, in other words, to establishment of the maximum production potential.(3).

3. Results

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

Because of this 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, such as hours/ha, direct costs, costs of production and profit.
In table 1 there 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	Optimum	
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=herbiciding

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 were close of Ro_{MAX}. This favourable result was imposed by the colligation with the other indicators that have had high values: direct costs/ha, labour consumption, the maximizing of production being necessary in order to obtain the maximum profit which represents also an optimizing criterion.
Similar situations were recorded in systems E, ON/ID and ID/E. In the other systems ID and ON/E, the best production was lower than the maximum production recorded in the testing phase. Thus, in system ID, the best result was 10742 kg/ha, and the maximum obtained was 10680 kg/ha.

In table 2 there are presented the results of price optimizing.

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

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

Table 2. Results of utilization price optimizing (ROL/kg)

Nr. ctr.	System	Price of valorising			
		R_0		R_1	Closing variants R_{0MAX}
		Var.	Minim Maxim	Optimum	
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 ROL/ha)

Nr. ctr.	System	Direct costs			
		R_0		R_1	Closing variants R_{0MIN}
		Var.	Minim Maxim	Optimum	
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) was 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 ROL/kg is presented in table 4 and it 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 was 3409 ROL/kg and very close to Ro_{MIN}, 3442 ROL/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 ROL/kg

Nr. ctr.	System	Cost of production			
		R_0		R_1	Closing variants R_{0MIN}
		Var.	Minim Maxim	Optimum	
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 (R1) and in alternatives minimum and maximum in each system.

Table 5. Results of optimizing the profit (ROL/ha)

Nr. ctr.	System	Profit			
		R_0		R_1	Closing variants R_{0MAX}
		Var.	Minim Maxim	Optimum	
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 the maximizing of profit were come from systems ID, ON/ID and ID/E, the optimized profit would be under the limits of the maximum achieved (Ro_{MAX}), and the other three systems ON, E and PN/E would be 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 the alternatives with five and six weeding, even if the present few better indicators have had the lowest profit on the whole.
An example is the case of system ON/ID where the minimum profit (Ro_{MIN}) obtained in alternative 6P was less than 50% out of the maximum profit (Ro_{MAX}) obtained in alternative E + 1P.
It is noticed the fact that it exists a colligation of the results established experimentally and the optimized results prove 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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