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SPECIFIC METHODS APPLIED WITHIN THE STRATEGY FOR SUSTAINABLE DEVELOPMENT OF AGRICULTURAL EXPLOITATIONS

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Abstract

In order to obtain quality products, it is necessary to approach the components of plant culture systems in a unitary way. The methodology proposed in this paper takes into account the influence of all factors and the interaction between them, the solutions obtained comprising both elements that characterize the system of culture as a whole and elements that characterize its component parts. The strategy concept to be proposed is based on the realization of the concentration and specialization of agricultural production on the dimensions of a rational exploitation of the land under the conditions of real privatization. In fact, strategy is a therapy that, if operated in a sick social - economic environment like our current agriculture, can have catastrophic effects, without prior diagnosis or misdiagnosis, or on the contrary it proves to be beneficial when it is being fundamentally administered. Human decisions that engage the future cannot be inspired by a single methodology or mathematical calculus; in this sense Keynes said: We assume perfect predictions in analysis. But we know that the forecast is actually imperfect according to Keynes.

Key words**:** *agriculture, concentration, efficient, result, process*

INTRODUCTION

The fundamental problem of Romania's agriculture is that of agricultural production growth in the structure, quantity and efficiency determined by the land, investment and human potential that this branch of the national economy has. [7]

Organizing efficient production structures is a must for all types and forms of agricultural units, but especially for those producing for the market; especially under the requirements of the European Union that aquire the establishment of a rational structure of the Romanian agricultural production in order to orientate the agricultural profile of the training exploitations.

The production structure is organized in the process of adapting to the market requirements and the restrictions imposed by the natural environment, also induced by the peculiarities of the specialization, diversification and joining of the branches.

Given the particularities of agriculture, whether technical or economic, we find that the factors that require a diversified, even complex structure of production, obviously at a level of its development and the conditions of a particular agrarian policy, are numerous, with a strong influence and of an objective nature, such as: the attenuation of the seasonal nature of agricultural production (the inconsistency between working time and production time, especially in the field of plant culture where a series of natural processes are taking place); the efficient use of fixed and circulating capital components; the full use of the exploitation's workforce or of the employed one; organizing crop rotation, knowing their influence on the level of production; capitalizing on the productive potential of land capital; the capitalization of secondary crop production by animal husbandry; combat or at least mitigate effects of risk and uncertainty; protecting the natural environment and maintaining the ecological balance, avoiding the pollution of soil, groundwater, and products.

Concentration of agricultural production as a direction of the scientific organization of the productive activity in agriculture represents, in the current conditions of the technical

progress, an objective necessity, characteristic for the development of agriculture.
Concentration of agricultural production is a result of the concentration of production factors on the same land area. This process takes place in all branches of agriculture and in all agricultural exploitations.
In plant production the concentration of production is achieved both by increasing the areas cultivated with certain plants, but also by reducing the exploitations cultivating such plants.

MATERIALS AND METHODS

It has been demonstrated that not every level of production concentration can ensure a proper increase in yields and economic efficiency. The issue is to determine the optimal degree of production concentration, both at the level of the production branch, but also at the level of agricultural holdings. One of the ways of determining the level of concentration is that of O. Onicescu [9], which is based on the formula:

$G_c = \sum_{i=1}^{n} f_i^2$
where:

G_c = concentration degree;
f_i = share of the branch;
f_i^2 = concentration coefficient of each branch.

In order to determine the degree of concentration in the specialty literature we come across numerous indicators used for this purpose, each of which has a different sensitivity depending on the phenomenon studied [3] and therefore a great attention is needed when choosing the convenient indicator. [6]
A synthetic indicator of both the level of production concentration and the evolution of the agricultural production concentration process is the concentration coefficient calculated by the formula of C. Gini [2]:

$C = \sqrt{\frac{n \cdot c2 - 1}{n - 1}}$
where

$c^2 = \sum a^2$

and

$\frac{Xi}{X} = a$

in which
c = the concentration coefficient;
n = the number of groups;
Xi = the number of participants in group i;
X = the total number of participants.

RESULTS AND DISCUSSIONS

Using the above relationship we can calculate the concentration coefficient in the plant production on the level of the whole country.

Table 1. Grouping the individual agricultural holdings by size class

Year	Total	Size classes of agricultural holdings (ha)					
		<0.5	0.5-1	1-3	3-5	5-10	> 10
N-5	3,419,736	115,077	1,154,712	1,289,420	529264	330,364	899
N	3,960,332	445,405	1,027,494	1,355,695	693,354	426,010	12,374

Source: Own findings based on the data provided by the National Institute of Statistics.

Starting from the primary data and using the intermediate data shown in Table 2, we finally obtained:

C_{N-5} = 38.5%
C_N = 29.5%

These values illustrate the level of production concentration in the two years.
Analyzing the evolution over time of the concentration trend based on the same data shows that the degree of concentration in the agricultural exploitations surveyed decreased in exercise N compared to N-1 by 21.9%.
There is a trend contrary to Western European agriculture, where the production

concentration process has a high amplitude.
Concentration and specialization of agricultural production, in the conditions of intensification and diversification of the market economy, raises the question of the optimal size of the agricultural exploitation - one of the most important problems of modern agriculture.

Tabel 2. Intermediate values

Size classes of holdings	N-5		N	
	$\frac{Xi}{X} = a$	a^2	$\frac{Xi}{X} = a$	a^2
<0.5	0.033	0.00108	0.112	0.01264
0.5-1	0.337	0.11356	0.259	0.06731
1-3	0.37	0.14212	0.342	0.11718
3-5	0.156	0.02433	0.175	0.03065
5-10	0.096	0.00921	0.107	0.01157
> 10	0.001	0.00000	0.003124	0.00000
Total	**1.000**	**0.2903**	**1.000**	**0.23935**

Source: Own findings based on the data provided by the National Institute of Statistics.

The optimal size of an agricultural exploitation expresses the level at which production concentration can reach under maximum efficiency conditions. If the concentration process expresses the objective process of combining production on exploitations, the optimal size of the exploitation indicates between what limits (minimum and maximum) must the level of production concentration be set, the extent to which it should be grown on branches and sub-branches, in oreder to obtain large economic impacts, through the full use of existing technical and geoclimatic conditions, through the superior organization of production and labor [8].
Due to the changes in the structure of agricultural property and due to the complexity and the extremely different and concrete situation in which it has to be solved, the issue of rational sizing and the optimal size of agricultural exploitations becomes one of the most current problems of concentration and specialization of agricultural production .
In close connection with the size of the agricultural exploitation, its profile and specialization is also the optimal crop structure subsystem. Like the system as a whole, the structure of cultures, which plays a very important role in the way in which it manifests and in the results it generates, it is influenced by natural, economic, technical, technological factors, etc. An optimal crop structure must satisfy in a simultaneity relationship several requirements: to offer products that qualitatively and quantitatively meet demand, to value and protect the natural conditions and other factors of production, to allow the organization of the crop and to ensure an acceptable profit (in the current context of sustainable development, the notion of the optimal profit is transformed, with the preference of the suboptimal profit that allows the achievement of both ecological and social efficiency), allowing the entrepreneur a real economic growth [1].

CONCLUSIONS

Under the current conditions, in which it becomes more and more important to obtain quality agricultural products, it is necessary to approach the components of plant culture systems in a unitary way.
Starting from this point, the basic feature of the proposed methodology for optimization is the complex approach of the plant culture system, whose functionality is determined by a number of factors.
This methodology allows to take into account the influence of all factors and the interaction between them, the solutions obtained comprising both elements that characterize the system of culture as a whole and elements that characterize its component parts. The steps to be taken in this case are presented in Fig.1.
For the delimitation of the territory of the agricultural holding in homogeneous parcels with different productive potential, the economic appreciation of the land is used. In our country, the method of economic assessment of land developed by the Research Institute for Pedology and Agrochemistry is being used. In this sense, the economic appreciation is made on the land plots of the analyzed units. [10]
All parcels offering crops the same class of favorability are grouped together in a single plot, called unit plot [5]. In the present paper, I do not consider it necessary to present the

methodology of land consolidation, a complex action that has been carried out by specialists in this matter, however, it should be emphasized that the good knowledge of the favorability class of each plot provides the necessary information regarding the capacity of land production, necessary for the rational layout of crops.

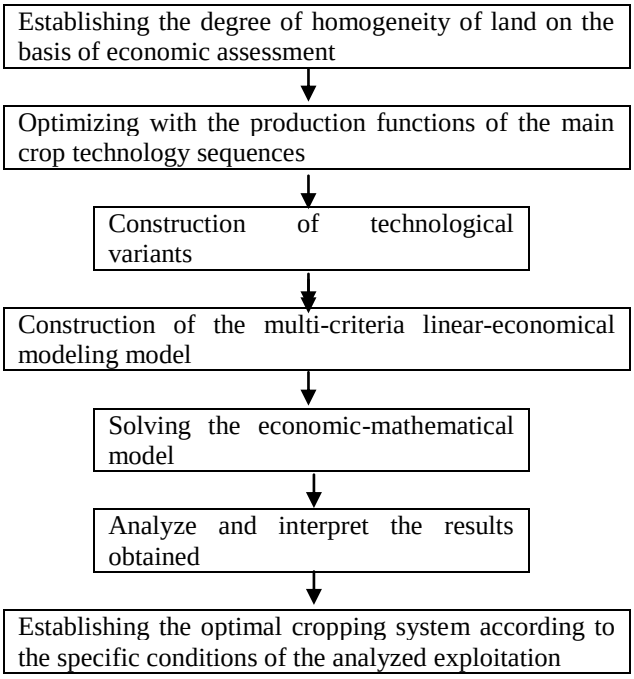

Fig.1. The Scheme for Economic Optimization of the Plant Culture System
Source: Hălmăjan, V., 1984, Metode şi tehnici moderne de amplasare a culturilor în unităţile agricole, Ed. Ceres, Bucureşti, pp.203 [5].

It is to be said, however, that only the homogeneity or inhomogeneity of the land is taken into account when establishing the optimization methodology of the plant cultivation system, the importance of the number of existing units is not being taken into account.

The main sequences of crop technology that lend themselves to optimization with the help of production functions are fertilization and herbicide, the methodology of optimization is similar. Regardless of the technological sequence to which we refer and the number of resources taken into study, to optimize the allocation of resources through production functions, the following steps must be taken:

-determining the sequences to be optimized;
-collecting data;
-statistical processing of collected data;
-choosing the type of function and testing it;
-solving production functions;
-establishing doses corresponding to the technical maximum and economic optimum

The construction of technological variants starts from the previously optimized sequences with the production functions help, considering that too many differentiation criteria are not being used in order not to increase the dimensions of the models too much: it is appropriate to vary only those sequences that require increased economic effort and which substantially influence the level of production and economic efficiency. These are followed:

-establishing the differentiation criteria;
-building technological variants;
-calculation of technical and economic indicators of built-up variants.

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