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#### COMPUTER AIDED RESEARCH. APPROXIMATIONS AND INTERPOLATIONS USING THE "MATLAB" SOFTWARE IN ORDER TO SIMULATE THE DEVELOPMENT OF THE VINE'S GROWTH STAGES

### Authors: Marian NICOLAE\*, Elena NICOLAE\*, Nicole Livia ATUDOSIEI\*, Gianina FLORESCU\*

#### ABSTRACT

"MATLAB" is a programming language likewise a developing system which integrates the calculation, the visualisation and the programming in an easy way. The problems and their solution are concurred in an available mathematical language. Starting from the experimental data, the accumulation of the dry substance like a function of active temperature ( $\sum^{\circ}C$ ) and time (t), the software gets a function which brings the increase of vine SU( $\sum^{\circ}C$ , t), through interpolations with a very little step; so, this evolution can be determined empiric.

For mathematical thoroughness in the approximation of functionaccumulation of dry matter (SU) depending on the temperature have used a variety of functions: exponential, logarithmic, polynomial depending on the type curve nonlinear sometimes fragmenting the diagram on parts. Simultaneous we can choose the function that proximate the best the experimental data by using dedicated software and we can get the values y=f(x) by interpolation  $y_i=f(x_i)$ , the interpolation step being very small,  $10^{-6}$ . We can make such calculations of the value of dry matter (SU) not by experimental way, but by using the applied sciences on computer. Where experimental data collection are a disparate values we can complete, however small it would be intervening Variation  $\Delta x$ , can learn at any time variant  $\Delta SU$ .

**Key words:** approximation, interpolation, "MATLAB" software, process stages, simulation, substance.

#### INTRODUCTION

"MATLAB" is an inter-active system based on the frame which allows solving the numeric calculation problems, especially those ones that need vectors or matrix processing.

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This programme allows both the estimation of calculation sequences with a data kit introduced directly by the user with immediate results and the elaboration and the repeated use of calculation programmes for solving similar problems using a different initial data kit.

Therefore, the programme was developed as a tool aiding the integrate and simultaneous performance of these activities.

#### **MATERIAL AND METHODS**

Our research activity has run within Vineyard Experiment Station of Dragasani, Romania, using "Cranposie selectionata" vine variety during 2006. We started from separate experiment data (SU( $\sum^{\circ}C$ , t), accumulation of dry matter according to the active temperature) and afterwards we tried by interpolation (polynomial, cubic methods) to determine which is the function that approximates best the real evolution. What counts most is that "MATLAB" performs both one variable –interpolations and two variables SU( $\sum^{\circ}C$ , t) interpolations.

Types of approximations that use "MATLAB" for finding the accumulation of dry matter according to temperature and time. MATLAB enables the direct type work and the programme - type work (by using the m. source files). For the illustration of the processes, we edited the data in a m. data text file, with the following contents:

6	10	20	65	126	172	205	→ days
183	250	346	1060	2430	3320	3740	→ temperature
1	6	250	875	1600	2380	2615	$\rightarrow$ dry matter DM

According to the next table:

Month	1	2		3	4			5	6	7	8	9	10	11	12
Withth	Jan.	Feb	r.	March	Apri	1		May	June	July	Aug	Sept.	Oct.	Nov	Dec.
Date	-	12	20	-	6	10	20	-	5	-	5	21	23	-	-
No.of days	-	-	-	-	6	10	20	-	65	-	126	172	205	-	-
Stage	RP	PS	VT	-	SH	BO	FO	-	FLO	-	ME	FM	LF	RP	RP
∑°C active	-	21	42	-	183	250	346	-	1060	-	2430	3320	3740	-	-
DM(g)	-	-	-	-	1	6	250		875	-	1600	2380	2685	-	-
-	-	-	-	-	Activ	ve per	iod							-	-

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Where:

- RP relative pause
- PS Physiological start
- VT Vine Teardrops
- SH Shooting
- BO Buds Opening
- FO Flower Outburst

- FLO Flowering
- ME Mellow
- FM- Full Maturation
- LF Leaves Fall
- DM Dry matter

All these data are loaded using the following enter-order: "load date.m".

The point drawing of the graphic is saved in the m.graphic drawing file.

```
x=[183 250 346 1060 2430 3320 3740]; → experimentally determined xi, yi
pairs
y=[1 6 250 875 1600 2380 2615];
                   \rightarrow graphic is drawn by 4 degree polynomial approximation
p=polyfit(x,y,4)
x1=180:.1:4000;
y1=poly-val(p,x1);
plot(x,y,'o',x1,y1);
a=[183 250 346];
                    \rightarrow experimentally determined xi, yi pairs
b=[1 6 250];
                   \rightarrow graphic is drawn by 4-degree polynomial approximation
r=polyfit(a,b,4)
a1=0:.1:350;
b1=polyval(r,a1);
plot(a,b,'o',a1,b1);
                               \rightarrow experimentally determined xi, yi pairs
m=[1060 2430 3320 3740];
n=[875 1600 2380 2615];
t=polyfit(m,n,4)
                   \rightarrow graphic is drawn by 4-degree polynomial approximation
m1=350:.1:4000;
t1=polyval(t,m1);
plot(m,t,'o',m1,t1);
plot(x1,y1,'o', a1,b1,'x',m1,t1,'*'). The running order is: run m.graphic drawing
```

#### **RESULTS AND DISCUSSIONS**

Using the Polynomial method: We will approximate the experiment curve using a 5-degree polynomial, as the other 2-degree, or 3-degree or 4-degree polynomial approximation or higher than 5-degree approximation (by this variant) produce high errors.

The 5-degree polynomial function is expressed by:

$$y = 2*10^{-27}*X^5 - 7,2*10^{-11}*X^4 + 6,2*10^{-7}*X^3 - 0,0018*X^2 + 2,5*X - 450$$



The calculation procedure of a p(x) value: we find in the calculation file the m.value which has the following contents:

x=180:1:350; p=[p1 p2 p3 p4 p5 p6]; polyval(p,346) r=roots(p) Where :

"p1...6" are the polynomial coefficients and the "root" function determines the respective polynomial root.

Interpolation helps us find in an easy way the yi (xi) values, with a very small variation step (1, 0.1, 0.1., 0.01, 0.001); the m.interpolation file has the following contents (we draw the graphic by means of the "plot" function after having achieved the interpolation):

x=0:10; y=x.^2+5.355\*x-8.145; xi=0:.25:10; yi=interp1(x,y,xi) plot(x,y,'o',xi,yi)

or we can use a "spline" interpolation that we can find in the "interp.m. spline" file:

x = 0:10; y = 2.235\*x.^3+2\*x.^2-55.2687\*x-8.56; xx = 0:.25:10; yy = spline(x,y,xx) plot(x,y,'o',xx,yy) {fplot('2.235\*x.^3+2\*x.^2-55.2687\*x-8.56',[2 8])}

#### **100 Step Spline Interpolation**

We will compare the interpolated values to the experimentally determined ones and we notice that in any xi moment we may find the yi value.

Item	T Experimentally measured $\Sigma^{\circ}C$ active	T Step Interpolated 5∑°C active	Experiment Dry Matter	Interpolated Dry Matter
1	346	350	250	236,51
2	Non-determined	1050	Non-determined	863,96
3	1060	1060	875	869,09
4	Non-determined	2425	Non-determined	1601,1



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5	2430	2430	1600	1605
6	Non-determined	3315	Non-determined	2371,2
7	3320	3320	2380	2375,1
8	Non-determined	3735	Non-determined	2615,6
9	3740	3740	2685	2617,2

We may notice close values of the dry matter as related to the active temperature.

#### An example of two-variables multiple interpolation (with experiment data using "MATLAB")

x=[6	,10,20,	65,126,1	72,205]	$\rightarrow$ day	no,.				
y=[1	83,250	,346,106	60,2430,	3320,374	$40] \rightarrow te$	emperati	ure		
z=[1	,0,0,0,0	),0,0;0,6	,0,0,0,0,	0;0,0,25	0,0,0,0,0	);0,0,0,8	75,0,0,	0;0,0,0,0	1600,0,0;
0,0,0	),0,0,23	80,0;0,0	,0,0,0,0,	,2615] –	→ DM				
z =									
	1	0	0	0	0	0	0		
	0	6	0	0	0	0	0		

0	6	0	0	0	0	0
0	0	250	0	0	0	0
0	0	0	875	0	0	0
0	0	0	0	1600	0	0
0	0	0	0	0	2380	0
0	0	0	0	0	0	2615

zic=interp2(x,y,z,172,3320,'cubic') zic=2380

zic=interp2(x,y,z,170,3315,'cubic') zic=2352

#### CONCLUSIONS

The active temperature and especially the useful ( $\geq 10$  °C) temperature control in a visible manner the daily growth rhythm of the vine and prove once again the meteo-sensitivity of the vine.

We also notice the multitude of the interpolation methods and the libraries rich in approximation (logarithmic, exponential, polynomial) functions. The result scored by using the same interpolation method (for instance the 5-degree polynomial method) within different softwares (Microcal Origin, Matlab, Microsoft) shows that the differences are extremely low, and the coefficients differ very few. Analysing the programme facilities, we note the superiority of the MathSoft product – i.e. MATLAB – thanks to the graphic expression possibilities and the very efficient calculation power.

We must point out that many times the curves (the enter/exit data kit) must be treated sectional and we must find the function type that approximates best reality. We scored fin results using polynomial interpolations – i.e. 5-degree polynomial interpolations, where "n" is the P(x) polynomial degree  $=a_nx^n + a_kx^k + ... + a_0$ . We got 6 experimental values, and consequently 6 coefficients i  $a_k$  and therefore we got n=5, the optimum degree of the interpolation polynomial.

To approximate the dry matter accumulation function according to temperature, we used different functions: exponential, logarithmic, polynomial ones, in conformity with the type of the nonlinear curve, and we sometimes fragmented the graphic by sections.

After the selection of the function which approximates best the experiment data by using target soft wares, we may find out the y=f(x) values by y=f(x) interpolation, and the interpolation step is very small, like  $10^{-6}$ . This way we can determine the dry matter values, not experimentally but using applied IT. And therefore, wherever the experiment data collection has disparate values, we can fill it in, no matter how small the  $\Delta x$ , variation interval might be, and we can find any moment the  $\Delta$  Dry Matter var.

Significantly we may make predictions not only in y=f(x) form, a single-variable function (the accumulation of dry matter according to temperature- DM = f (T), but also in z=f(x,y) form, 2-variables function (the accumulation fo dry matter according to temperature T and evolution in time – t, DM = f(T,t)

By analysing the synoptic tables reporting the dry matter values (DM),

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both experimentally determined and interpolation determined according to a numeric analysis with IT aid, according to temperature (T), we find out residual values which tend to zero, and therefore, the values of the measured dry matter are very next to the dry matter determined with the computer aid (for instance: at a T=3320 $\Sigma^{\circ}$ C we have DM<sub>exp</sub>=2380g and DM <sub>int</sub>=2375,1g).

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#### ANALYSIS OF THE METHODS FOR THE ENVIRONMENTAL PRINCIPLES INTEGRATION WITHIN THE MANAGEMENT OF FARMS SITUATED IN NORTH-EASTERN PART OF ROMANIA

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#### ABSTRACT

Our studies focused on analyzing the integration practices of environmental principles for the management of several farms situated in the region North-East of Romania. This analysis was made on the basis of the data collected on 114 agricultural units. Statistical data were obtained through Structural Agricultural Surveys, which have been conducted last year.

#### **INTRODUCTION**

Together with the classical pollution factors, agriculture is also a potential pollution source for the eco-systems, which can be explained by the excessive, repeated application of chemical fertilizers and chemical phyto-sanitary treatments, using substances with remanent toxic effect that are not biodegradable. In this way, negative effects have been reported upon the entire soil-plant-people-environment system, manifested through the following:

- 1. pollution of environment, soil, water and agricultural products as a result of the large number of chemical treatments, applied every year, while in the case of certain diseases, even several times during the same vegetation period;
- 2. destruction of useful flora and fauna, in parallel with the increase of populations from certain species that have been inoffensive so far;



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- 3. emergence of phyto-pathogenic strains that are resistant to the action of chemical substances, by the selection of certain resistance or tolerance genes to chemical substances;
- 4. possibility of animal intoxication due to the consumption of fodder with pesticide residues;
- 5. intoxication of humans through the consumption of food with toxic residues with cumulative negative effects on people's health in time.

Taking these facts into consideration, as a method of agriculture protection, of environment protection implicitly against self-pollution by the excessive application of chemicals, the organic farming practice development is imperiously needed, which targets maximum productivity without altering environment quality.

As regards soil pollution, an overall picture of this phenomenon reveals that in the last 45 years worldwide, about 11% of the soil resources of the planet have been subject to degradation up to the level at which even its bioproductive functions have been altered. The specialists from Western Europe consider that about 25% of the Earth surface is subject to this threat.

As soil is exhausted, the rich countries will be obliged to import food so as to satisfy even the population's minimum needs. At the same time, the humus losses will determine an increased consumption of fertilizers and fuels for tillage. On the longer run, soil erosion will result in the increase of food prices, malnutrition, and mostly probably to the maintenance of certain endemic hunger areas. In this respect, the sustainable soil management needs to introduce certain generalized modifications in the agricultural practice in order to stop pollution and soil erosion, by implementing the measures specified in the Code of good agricultural practice.

#### MATERIAL AND METHOD

Our studies were developed under the project CEEX no. 56/2006 on the theme: "Modeling the response of agricultural holdings to the integration of economic and environmental principles through the sustainable management of soil resources", regarding the integration of economic and environmental principles and actions and the development of certain scenarios on the sustainable soil management.

The analysis of the implementation possibilities of the integrated pest control methods in the soil management was based upon the information BULLETIN OF SCIENTIFIC INFORMATION - NR.16 / 2008

obtained on the basis of the Structural Agricultural Surveys that were conducted in the counties: Vaslui, Iasi, Botoşani, Bacãu, Neamţ and Suceava. The data collected from 114 agricultural holdings were centralized and analyzed in order to characterize the "agricultural holding" system, the production technologies and the soil and environment management quality.

The results of these analyses will serve the design of certain scenarios regarding the response of agricultural holdings to the integration of economic and environmental principles in the sustainable management of soil resources.

#### **RESULTS AND DISCUSSIONS**

The next table presents the distribution of the investigated farms in the territory by counties, by the production structure and ownership form.

Table 1:

County	Total farms out of which:	Crop production	Animal production	Mixed profile	Legal entities	Physical entities
Vaslui	20	2		18	17	3
Iași	20	5		15	17	3
Botoșani	18	7	4	7	10	8
Bacãu	20	4	3	13	17	3
Neamț	14	1	2	11	12	2
Suceava	22	2	1	19	17	5
Total region	114	21	10	83	90	24

Distribution of investigated farms in the territory

Out of total investigated farms, 21 are specialized in crop production, 10 farms in animal production and 83 are mixed farms (Figure 1.).



Figure 1. Distribution of agricultural holdings by activity type

The situation of arable land areas on the investigated holdings is the following:



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- 63 farms located in the plain-hill areas, covering 3009.82 ha arable land in total;
- 35 farms located in the hill area totalling 1793.97 ha arable land;
- 16 farms located in the mountain area, totalling 88.18 ha arable land; total farms subject to the survey:114 farms with 4891.97 ha arable land (Figure 2).



Figure 2. Distribution of total agricultural land areas by relief units.

As regards the agricultural production methods that are used, out of the total number of investigated farms, only 3 farms in the county Iaşi are under reconversion to organic farming (physical entities), the remaining 111 farms being conventional farms.

The analysis of data referring to the agricultural practices used by these farms reveals that 83.53% of total arable land was tilled with plough or disk, while disk harrowing was practiced on 78.83% of total. For weed and pest control mainly chemical and mechanical methods were used (Figure 3).

The chemical weed control was performed on 24.17% of total arable land, by herbicidation on 61.55% and by manual weeding on 2.44%. Weed control by insect-fungicides was applied on 20.64 % of total arable land. The high percentage of the chemical control methods is explained by the economic efficiency of this practice, determined by the fast and maximum effect of the utilized substances.

Referring to the fertilization methods, chemical fertilizers were applied on about 78.48% of total arable land, both chemical and organic fertilizers were

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applied on 13.36%, while only organic fertilizers were applied on 4.51% of total arable land. One quarter of the interviewed farmers applied nitrogen-based chemical fertilizers twice a year, the remaining only once a year. Only 11 farms bought manure, from 20 to 300 tons per year (about 600 tons/year/total farms). This was spread directly in the field under solid form.

It is worth noticing that the decision regarding the application of chemical or organic fertilizers was based on the following: only on 11 farms the decision was based upon the soil analysis, 13 farms respected the farms fertilization plans, in 18 cases the information from the consultancy services was taken into consideration, 6 farms followed the information from the chemical plants, while 76 cases made the decision according to their own experience.



Figure 3. Situation of agricultural practices used in the region

As regards the integrated pest control methods, the centralization of the field data reveals that out of the total area of 4891.97 ha arable land, chemical control was applied on1957.67 ha, accounting for 40.02%. The pest resistant varieties were cultivated on about 1171.82 ha, i.e. on 23.95% of total arable land. The biotech methods were applied on 15.52% of total arable land. The biological control was applied on only 0.09% of total arable land, while the cultural methods on 1.67% of total arable land (Figure 4).





Figure 4. Share of integrated pest control methods (% of total arable land)

The situation of minimum soil conservation tillage and of the soil erosion control methods is presented in Figures 5 and 6.



Figure 5. Situation of minimum soil conservation tillage

Direct sowing was applied on 1031.9 ha, i.e. on 21.09%, while strip tillage on 241.02 ha (about 4.09% of total arable land). No vertical tillage techiques were applied, while ridge plowing was applied on 1.57%.

The situation of soil erosion control works by relief units is presented in Table 2.

		Area			
		(ha)			
Soil erosion control	Plain-hill	Hill	Hill-	Total re	egion
methods			mountain	ha	%
Winter crops	679.2	234.55	6.18	919.93	18.8
Intermediary crops	0	10.92	0	10.92	0.22
Spring works	31.98	5.5	0.95	38.43	0.78
Autumn works	954.58	1207.01	76.91	2238.5	45.75
Slopes over 12% cultivated with row					
crops	29.6	20.5	0	50.1	10.24
Total ha	1695.36	1478.48	84.04	3257.88	66.59

#### Table 2: Soil erosion control methods

It can be noticed that on all the relief units the autumn works were applied on the largest areas (45.75%) for the winter crops (18.8%) and row crops (10.24%).

As regards crop rotation it can be noticed that on 52 farms out of total investigated farms this beneficial technique has been used, while on 62 farms this technique has not been used (Figure 6).



Figure 6. Distribution of the crop rotation farms in the territory

The land areas used under crop rotation totaled 277.06 ha, which represent about 56.66% of total arable land (Table 3). The average number of crops under crop rotation was 4-5 crops on the large farms and 2-3 crops on the small-sized farms, with an average rotation period from 2 to 4 years.

Table 3

Area under crop	То	tal
rotation	far	ms
	На	%
Plain-hill	1467.45	48.75
Hill	1222.6	68.15
Hill-mountain	82.01	93
Total	2772.06	56.66

#### Arable land area used under crop rotation

As regards the crop protection measures, out of the total arable area of 4891.97 ha / total farms, weeds were removed manually on 1009.71 ha (weeding or hoeing), while the mechanical method was applied on 1938.06 ha (Figure 7).

In order to reduce the number of predators or parasites, no biological methods were used, only chemical methods. The preventive or curative chemical methods used to avoid insect infestation and weed development were applied on 1309.44 ha, while the curative chemical methods were applied on 159.71 ha out of total arable land.



Figure 7. Situation of methods used for crop protection

#### CONCLUSIONS

Our investigations on the 114 farms from the region North-East of Romania revealed that the organic and the environmental practices have not been well implemented in the soil management practices. Organic fertilization and the mechanical weed control are applied on quite small areas, compared to the areas where chemical treatments are applied, even on the 3 farms in the conversion period.

Out of total arable land, chemical fertilizers were applied on about 78.48%, both chemical and organic fertilizers were applied on 13.36%, while only organic fertilizers were applied on 4.51% of total arable land. One quarter of the investigated farmers apply nitrogen fertilizers twice a year, the remaining farmers only once a year. Only 11 farmers buy manure (about 600 tons /year/total farms).

The excessive application of chemical fertilizers (2-3 times per year) without taking into consideration an evidence of soil treatments and analyses, may result in a series of soil and water pollution problems, even in the pollution of agricultural products in the future. The use of large amounts of pesticides each year are harmful for the fauna and flora on the respective areas, generating great health risks both for people and for animals. They may even induce cancer when their toxic, remanent and non-biodegradable effect is not taken into consideration.

In order to diminish the water, soil and agricultural products pollution risks, the following recommendations should be followed:

- 1. use of low toxicity fungicides;
- 2. respect of doses and diminution of the number of treatments;
- 3. application of treatments only at warning;
- 4. use of selected products and of low remanence products;
- 5. use of complex products;
- 6. handling of chemicals and application of treatments only by specialized staff.



The economic efficiency of crops will be ensured by the diminution of chemical treatment applications and the correct use of crop management, biological and biotechnological techniques that do not affect the agro-eco-system integrity.

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#### STUDIES REGARDING THE IMPLEMENTATION OF AGRO-ENVIRONMENTAL INDICATORS ON SMALL AND MEDIUM FARMS FROM PLAIN, HILL AND MOUNTAIN AREAS

Lecturer dr. Maria MANIU, Lecturer dr. Camelia GAVRILESCU\*, Conf. dr. Nicole ATUDOSIEI, Prof. Dr. Floarea NICOLAE, Assist. Cristian LEPĂDATU, Dr. Ing.Marian Nicolae

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#### ABSTRACT

The aim of this research was to analyze the practices for the implementation of environmental principles in small and medium farm management. Studies have been done according to collect information from fifty agricultural holdings with different ownership forms, located in Timis, Arad, Olt, Ialomita and Teleorman counties.

#### **INTRODUCTION**

Taking into consideration the problems related to the evaluation of aspects regarding the interaction of the agricultural practices with the environment, at the European level permanent efforts have been made in order to select a set of indicators that should make it possible to *evaluate the factors contributing to agricultural production*, which also have a significant *impact upon the environment conditions*.

The indicators taken into consideration fall into the following three main groups:



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#### a) Indicators estimating the land use intensity

- Share of irrigated area in the Utilized Agricultural Area (UAA), the irrigations being the main source of agricultural water use;

- Average yield per hectare in the main crops, i.e. the intensity of the agricultural production systems applied;

- Share of agricultural holdings in which the cereal crops cover more than 50% of the Utilized Agricultural Area, providing information on the specialization level of the agricultural production systems applied;

- Share of land areas under natural pastures in the Utilized Agricultural Area (UAA), providing information on the agricultural production systems applied;

- *Animal herd density*, reflecting the concentration of livestock production at regional level.

## b) Indicators regarding the fertilizer application: fertilizers, chemical and organic

- *Nitrogen supplied from livestock manure;* indicator reflecting the nitrogen pollution problems, which are closely linked to the livestock production systems where a nitrogen surplus occurs resulting from animal dejections; it indicates the "hot areas" where the livestock raising activities are concentrated, and the regions where the limits established by the EU Directive on nitrates are exceeded;

- *The nitrogen surplus* identifies the nitrogen flows in the agricultural system and permits the selection of options targeting the efficiency increase in nitrogen use; it indicates the regions where the nitrogen is used in excess, compared to the necessary nitrogen amounts for the crop production.

#### c) Indicators regarding pesticide application

- The data regarding the direct use of pesticides, by types, permit to get information on the land area where pesticides are applied, on the applied dose, application frequency for each relevant pesticide type, for the relevant crops;

- *The data regarding the sales, by pesticide type,* permit the indirect measurement of the active ingredient;

- *Cost of pesticides, by crop*, the total cost of pesticides for a certain crop reveals the relative volume of pesticides applied.

The use of a harmonized system of agro-environmental indicators permits the characterization of the relation between the agricultural practices and the environment, while limiting the disputes that may appear in relation to information relevance.



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#### **MATERIAL AND METHOD**

Our studies tried to analyze the possibilities to implement the environment protection methods in the soil management on the small and medium-sized farms located in the plain, hill and mountain areas. The obtained information was collected during the structural field surveys that were conducted in the counties Timiş, Arad, Olt, Teleorman and Ialomiţa. The data collected from 50 agricultural holdings were centralized and analyzed for the characterization of the "agricultural holding" system, of the production

technologies and quality, of the soil and environment management quality. The results of these analyses can serve to the development of scenarios with regard to the response of agricultural holdings to the integration of economic and environmental principles and to the design of agro-environmental indicators with regard to *farm management*.

#### **RESULTS AND DISCUSSIONS**

The investigated agricultural holdings are located in different areas with different relief units and fall into three categories: 18 holdings specialized in crop production; 1 animal farm and 31 (crop and animal) mixed farms.

Table 1

Distribution of investigated farms by areas						
Area	No. of holdings	Area	No. of holdings			
Plain	16	Hill-mountain	11			
Plain-hill	13	Mountain	1			
Hill	9	Total holdings	50			

The share of the 28 private agricultural holdings on a comparative basis to that of the legal entity farms is presented in Figure 1.





Figure 1. Legal status of the agricultural holdings by relief units

The analysis of data referring to the share of the arable land in total investigated farms reveals the fact that the arable land accounts for 92.2% (10,209.44 ha) in the total area of the 50 farms summing up about 11,069.62 ha (Figure 2).



Figure 2. Percentage share of arable land in total arable land

In the hills and mountain areas, about10-18% of the total land area is under orchards and/or natural hayfields.

Out of the 50 farms, no farms with organic production were identified in any geographic area, while the number of farms in the conversion period is very low (Table 2).

Table 2

#### Situation of production methods used on farms

Relief units	Total conventional farms	In the conversion period	Organic
Plain	14	2	-
Plain-hill	12	1	-
Hill	9	-	-
Hill-mountain	11	-	-
Mountain	1	-	-
Total	47	3	-

*In the plain area* the integrated control mainly consists of chemical methods applied on 2765 ha from the total arable land (6207 ha). Only 10% of the arable land was cultivated with pest resistant varieties.

In the plain-hill area, out of the total arable land area of 1722 ha, chemical pest control methods were applied on 959 ha. The pest resistant varieties were cultivated on about 37 % of arable land. In the hill area, chemical methods were applied on 730 ha of the total arable land of 959 ha, and only 3.94 ha were cultivated with resistant varieties.

In the hill-mountain region, out of arable land totaling 1290 ha, chemical methods were applied on about 1001 ha and only 62 ha were cultivated with resistant varieties. In the case of the agricultural holdings from the mountain area, chemical pest control methods were applied on the entire arable land area.

It can be easily noticed that biological and/or biotechnological pest control methods have not been used on any investigated farm.

Overall, the analysis of centralized data on the minimum tillage reveals that in the plain areas mainly zonal strip tillage was used, while in the hilly regions mainly vertical tillage techniques were used. Direct sowing was practiced only on very small areas.

From the collected data, it results that in the hills areas the land areas under slopes cultivated with row crops increase, while the land areas under winter crops decrease. The investigated farms have not reported the cultivation of intermediary crops.

The analysis of centralized data reveals that in most geographic areas mainly winter crops are grown, while the intermediary crops are almost nonexistent (except for the plain zone).

As regards crop rotation, out of total 50 investigated farms, in 12 cases the crop rotation is not used, while the other 38 farms use this technique (Figure 3).

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The average number of crops used in crop rotation is 2-6, while the average period of rotation is 2-4 years. The area under grass in crop rotation totals 110.75 ha / 38 farms.

As regards the crop protection methods that are used, the reported areas are the following:

• Physical method (weed removal by hand, weeding, etc.)	305.00 ha
Mechanical method (mechanical weeding)	2444.18 ha
• Biological method (use of predator or parasite organisms)	4.67 ha
• Preventive chemical method (avoiding the infestation with insects	or weed
development)	5886.05 ha
Curative chemical method	
(fight against the problem that has appeared)	. 731.29 ha

Referring to the decision techniques on the applied treatment, the answers were the following:

• treatment scheme	13 cases
• specialized state or private consultancy	13 farms
• mass-media prognosis (radio, TV, specialized jounals)	7 farms
• consultancy from pesticide suppliers	9 cases
• decisions are taken only when the economic injury threshold h	as been reached
(the curative treatment is applied only when the damage produce	ed by pests is
equal to the treatment cost)	0 cases
• from farmers' own experience	33 farms.



Figure 3. Situation of farms using crop rotation

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#### CONCLUSIONS

Out of total 50 farms only 3 use production methods specific to the conversion period to organic farming, which target the environment protection measures in the current production practice. The remaining farms manage the agro-environment resources according to the conventional practices specific to intensive farming.

In relation to the good agricultural practice of sustainable soil management, the analysis of overall centralized data proves that in most cases the ecologic management of soil fertility is quite deficient. The organic fertilization and the weed control my means of cultivator is practiced on very small areas compared to those where chemical treatments are applied through the administration of chemical fertilizers and pesticides. These deficient agricultural practices are even found in the case of the 3 farms under conversion to organic farming.

The data referring to fertilizer application (organic and chemical fertilizers) prove that the nitrogen from animal dejections is not in excess, as the areas under organic fertilization are very small (about 500 ha/ 38 farms) compared to the total arable area of 10209 ha (out of 50 farms).

In spite of all these, certain problems related to nitrogen pollution may appear, due to the high share of areas on which chemical fertilizers are applied and to the inadequate disposal of animal dejections (inadequate storage spaces, piles of manure in the vicinity of water sources). The absence of adequate storage places may result in serious problems of water pollution and other problems linked to gas emissions.

As regards the pesticide pollution risks (insect-fungicides, herbicides), we can notice that about 80% of the total arable land has been chemically treated

for pest control (8247.69 ha out of total 10209 ha). In most cases, the treatments were applied according to farmers' own experience rather than on the basis of certain treatment schemes established by competent people.

In order to solve up these problems, the application of the following measures is imposed:

- 1. better management of natural resources, mainly soil and water;
- 2. using the soil rotation systems on larger scale and use of organic fertilizers;
- 3. implementation of organic farming specific principles;

- 4. implementation of environment protection measures through a sustained financial support;
- 5. crop diversification in order to ensure the ecologic and economic stability of agricultural holdings;
- 6. application of afforestation programs on certain land areas that are not suitable for agricultural production and establishment of shelter-belts;
- 7. implementation of education and training programs for the young people and managers in agriculture.

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#### PRIORITIES OF THE AGRICULTURAL MANAGEMENT IN ROMANIA AT THE BEGINNING OF THE III MILLENNIUM

#### Horia Dorobantu<sup>1</sup>

#### RESUME

The actual world's economy confronts with multiple and complex issues, among of the agricultural crises of products and services, associated and connected with the financial and capital crises are major threats of the world's security and stability.

Technological developed countries, including the biggest Trans national companies' intensified the commercial competition, sometimes stepping of the limits of the legal and even of the morality, in the detriment of the poor/not developed and transition countries, the most of the planet population.

An important, major and contemporary issue admitted also by the O.N.U. represents the elimination of the poverty and malnutrition.

For acquiring this objective, at the world's scale and also for the countries that are members, presumes the willingness of all the countries to collaborate on multiple plans: politically, technically, financially, including the improving of the human resources.

Valuing the agricultural potential of Romania assumes identifying professional public and private management instruments and techniques capable to lead to the raising of the competition of the economy as a whole and in particular of the agriculture, which in our opinion represents an internal source not exploited accordingly.

Agriculture, as a primary sector of our national economy it is necessary to get a special attention by elaborating a coherent system of policies and strategies specifics to each product of the entire chain: production-distributionconsume, by this way we can eliminate the "non uniform" and "modelling" conventional and non performing practices.

**KEY WORDS :** globalization of the agricultural market, behaviour on the market of the companies and their managers, the management as a resource of the economical and social progress, instruments and techniques of optimization

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The humanity confronts at the beginning of the millennium with multiple challenges, which are being very difficult to handle. Among these some started to get the characteristics of tendency, which provoke a bigger concern, at national level and also international. Without realizing an inventory of these we will point out the most significant ones:

1. - the accentuation of the specific crises of the different market segments, which are in interdependence: the crises of the charge stock and energetic; the food products crises; the financial crises, etc, which reveal a lot of negative impacts in the economical, technical, social domains, in the developed countries but more accurate in the not developed/poor countries, including the countries with a transition economy. The exaggerated raising of the oil price, the USA government intervention with an amount of 700 billion \$ for stopping the financial-banking crashing or the acceptance by the English restaurants of food products instead of the money, are definitely strong proofs for big concerns in different countries around the world.

2. - the consolidation of the integration and globalization of the worlds' economy with positive consequences and also negative ones of the balance on world scale and also national. The phenomenon of concentration and consolidation of the capital force at the level of some multinational companies which activates on different market segments of the international agro alimentary market generated anomalous behaviours towards the environmental protection or even breaching the elementary rights of the countries, syndicates and consumers. The speciality literature coats cases of STN like: Coca Cola, Nestle, McDonalds', companies known around the world which did acts and facts illegal and immoral such as: exploiting children, persecution of the syndicates, distribution of improper products for babies, etc.

3. - the raising of the social polarization degree national and also international. It is emphasized the abyss between the riches and the poor, in the context that the numbers of the poor keep raising (globally speaking, but also in different countries: rich – well developed, on the way of developing or in transition)

Information recently launched by Romanian press agencies stated that in our country there are almost 3 million "poor to death" distributed not equally in areas like: Moldova, the poor rate is 35%, whereas in Bucharest is 10%. Major consequences of these tendencies are the following:

• Internally, the raising of the un satisfaction and social instability and internationally we assist at the raising of the immigration of the work force from the poor countries to the rich countries, which offer more jobs and better paid.

Segments of the national and international agriculture market are involved in an intense process of commercial competition, legally and also illegally, aspects confirmed by the internal statistics of the agriculture commerce, but also international, including the information for the population access being provided by the press agencies and the speciality literature.

The researches made by the civil society (journalists, consumers' protection associations) had revealed acts and facts totally unscrupulous made by the big companies in their urge for profit. Much more combining financial forces and manipulation of the markets some STN elaborated lobby strategies under the curtains of international commercial organizations: GATT (OMC), FMI, BM, etc.

Behind these organisations are the boards of administrations of the STN and the important banks and companies of the world, which in meetings with "closed doors" adopt decisions very well sustained by the well-known lobbies: ICC, TABD, USCIB, WEF, IIF, DIHT, IV, etc and "are trying to influence the politics of the countries in accordance with their beliefs".

Some of these lobbies companies use methods in total contradiction with the social interests, including the national ones where they are running their activities.

Such national and/or international organizations with lobby activities in the international commerce, by way of influencing the large corporations are given as examples below:

- <u>American Business Round Table (BRT)</u> USA has almost 200 concerns to sustain in international market. The association promotes the existing not only of the Conventions/Treaties but also some voluntary conventions. It runs actions of influencing to WTO in order to adhere to the Investment Multilateral Treaty. Working for NAFTA, FTAA, Coca Cola, Genera Motors, Shell Group, Deutsche Bank
- b) <u>European Round Table(ERT)</u> UE promotes the freedom of the commerce. Runs very powerful lobby in the EU for: Nestle, Shell Group, Bayer, BAT, Siemens.
- c) <u>International Commerce Chamber (ICC)</u> promotes the freedom of the commerce and is against the environmental protection (fighting against the Kyoto protocol, Biological Diversity Convention, Basel Convention



regarding the Transport of the garbage). Runs lobby for OMG and TRIPS at the OMC.

- d) <u>International Commerce Council USA(USCIB)</u> is made up of around 300 companies with the scope of stimulating the freedom of the commerce and finances. It is the American correspondent of ICC and International Employers Asociation. Run lobby for Global Investment Agreement (MIA). It supports GW Bush against the Kyoto Protocol and sustains the freedom of investment at OMC.
- e) <u>World Business Council Sustaining Development (WBCSD)</u> is an organization of environmental protection, but runs lobby for voluntary conventions, without the possibility of controlling and/or sanctioning the companies or countries who produce by their acts or facts damage in their field of activity.

Romania, as it is known, it was admitted as a member of EU in 2007, following the engagement to respect the clauses of the Adherence Treaty and specially the safeguard clause of the two chapters Justice and Competition.

This clause settles the context in which we can take some repairing measures (by the European Committees) if some engagements, after adhering, were taken to its purposes.

Competition clause takes in consideration the fact that our national economy is not competitive yet and functional at the level of the unique European market.

There is the risk for some Romanian company no to put up the competence of the European companies, taking in consideration the 4 fundamental freedoms consecrated on the unique market.

The immediate and direct consequence of the lack of capacity of the Romanian companies to put up the competence pressures from the internal market represents the bankruptcy of these and in the same times the multiple negative consequences of social order.

Some statistics official dates regarding the Romanian agriculture economy are evident: with a rate of 32,2% of the occupied population in agriculture (of the 5,9% in EU), the contribution of the agriculture in realizing the PIB in 2005 was 9%.

In Romania there is a total number of 4.256.152 agricultural exploitations, out of which 4.237.889 are individuals and only 18.263 are juridical companies.

The total utilized surface is 13.906.701 ha out of which 4.804.683 ha belongs to the juridical companies. It results a medium agricultural exploitations of almost 3, 3 ha, out of which individuals 2, 2 ha, respectively 263, 1 ha for juridical companies.

The Romanian specialists from the agricultural field estimate that the surface of agricultural land in Romania can produce food for almost 80 millions inhabitants. In 2006, the Romanian agriculture exported meat and meat preparations in amount of 37 millions of EURO and imports the same in amount of 511 millions of EURO, and the export for fresh fruits and vegetables was in amount of 89 millions EURO whereas the import was 358 millions EURO.

For the entire agricultural surface there are a number of 173.043 tractors. The contribution of the agriculture at the external commerce of Romania is accordingly to the statistics, for 2005 the volume of the export 414 millions EURO and the volume of import 475 millions EURO.

The external payment balance has a passive balance of 9,6 billions \$ and a current account again passive of 6,8 billions \$ in 2005, we may conclude that the Romanian economy does not have the characteristics of an efficient, competitive and functional one, capable to put up the actual competitive force of the world's economy.

A structure of the Brut Internal Product, on comparisons elements, after the expenditure method, in 2006, is: the final consume of the population 68,9%, final consume of government 16,6%, the brut forming of fix capital 25,6% and the net export - 12% reflects an economy orientated on consume rather then a real and positive increase. If we talk about increase, then this is based on external resources and not on internal ones.

The statistics speak for themselves: the Romanian agriculture is divided in individual exploitations and not technically gifted has a poor contribution at the economic and social progress of the country. In the management doctrine major changes took place in different domains concerning: the appliance of the exigencies in change of the components of the market, modifications in the dynamics and functions of the company, new dimensions regarding the attributes of the managers functions.

During the technical-scientific revolution the production function had a major contribution on realizing the huge offer existing on the market of the alimentary products; in the actual period of the commercial function and the marketing-communication the role was decided. It become harder to commercialize a product (service) then producing it necessary to the satisfaction of the consume on one market or the other

The past 50 years generated great major modifications in the structure and behaviour of the agricultural markets, and the policy of the company regarding the 4 P (price-product-promoting-position) is replaced by the policy of the 4 S (security-safe-satisfaction-service). In these conditions the consumer of the agricultural does not appear anymore like an external element of the production and distribution companies, but becomes a real partner of these in all the phases of the social reproduction.

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It is well known that on a dysfunctional market, like different agricultural markets, characterized by lack of products, the companies have a monopole (oligopoly) position, behaving in a total discomfort-despise with the potential client-buyer. On the contrary, on a normal market, the relation sellerbuyer is based on dialog and negotiation of the contractual clauses of sale purchase. The modification of the offer-demand on different market segments of the agriculture market generates other behaviours from the companies an also from the managers of these.

Will win the company that puts in the centre of its behaviour the client and his demands, context in which the social function of the company has other valences: the client becomes part of the interest of the company and his manager to develop and consolidate on the market and the ethical elements of the management are integrated in the mission, objectives, strategies and tactics of the company.The responsibility of the managers is no longer limited to the maximization of the profit, they will be obliged to change fundamental their attitude towards the client. The companies will be obliged also to get involved in solving some social and communitarian issues on the markets where they act.

The economic criteria of increasing the profit associates with other social values-criteria and the model of the classic management is changed step by step with a new model put in the service of the internal and external partners who activate on the market.

The entire system of "company culture" is a constant evolutional process of adapting to the exigencies of the durable development of the forming society and the business of the company will be healthy only if the wholecommunity where the company acts is healthy and equitable. In the context of the increased competition on internal market and the future perspectives of the effective and real integration of Romania in the structures of EU the following conclusions for the Romanian companies including the public and private management can be drafted:

- 1) Urgent necessity of increasing the professionalism of the top managers from all the companies that propose themselves the development, being known that contrarily the bankruptcy is inevitable, with multiple economical-social consequences on individuals, locally, communitarian, national scale;
- 2) Urgent necessity of creating partnerships with companies who already acts in the competition structures of EU and outside
- 3) Urgent passing to new models and techniques of management (product, project, etc to which the Romanian companies have difficulties in adapting)



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- 4) Re-technology of the Romanian agriculture companies accordingly to the communitarian technological exigencies
- 5) Initiation of partnerships "public-private" national and also international for increasing the efficiency and competition of the Romanian companies;
- 6) Re dimensioning of the production capacities taking in consideration the new requests of the unique market
- 7) Motivation of the labour of the employees in order to stop the labour for migrating where the salaries are 8-10 times bigger
- 8) Intensifying the collaboration of the internal public institutions with the ones from EU for increasing the access to the not payable fund
- 9) The raising of the transparency of the public management of the national communities (govern, counties, cities, villages) in realizing the projects necessary for utilizing the funds (national and EU) allocated for the development of the infrastructure in villages (public services, local resource, increasing the rate of professionalism, setting up competitive farms);
- 10) Realizing centres/offices of information regarding the communitarian institutions in the benefit of the Romanians also in the urban and rural in order to be able to participate at the public life, but also private in knowledge (equality of chance in report with the others communitarian habitants);
- 11) Re projecting continuously the public national institutions (Govern, ministries, agencies, authorities, city halls, prefectures) accordingly with the new challenges (internals and externals) to which Romania must answer and also EU taking in consideration the mission and the objectives assumed at the beginning of century.

The quality and the professionalism of the management in a country is in tight connection with the implementation of the legality to favourite the performance of the economic activities, including the agriculture.

A brief analysis of the agriculture legality in our country regarding the production and distribution of the agriculture goods and services both on the internal market and external one, reveals the fact that this was dictated, either for pure political-electoral conveniences, either for speculative financial incomes (the law of land or Government Decisions regarding the eradication of customs taxes and/or VAT for group interests).



The juridical management as an integrant part of public general management must have in sight the elaboration of normative acts to assure the economic and social progress.

These aspects-provocations of the transformation of the management (public and private) from our country in a professional activity evidences the fact the efforts to be made in the next period will be fully repaid by a real integration, with good effects also for the citizens and the national communities and also for the European Community as a whole.

Romania will bring this way the proof to the consolidation of the European Union as a great power of the 21<sup>st</sup> Century alongside USA, Japan, China, Canada, Brazil, etc, reaching the objectives of the European Continent.

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#### RESEARCH CONCERNING THE EFFECT OF CROSSING "ŢURCANA" BREED SHEEP WITH "SUFFOLK" BREED RAMS ON THE QUANTITATIVE PARAMETERS IN MEET PRODUCTION

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**Key words:** meat production, body weight, average daily weight gain, food conversion capacity, specific consumption, half-breeds.

#### SUMMARY

In this paper we have presented the results concerning the effect of crossing Turcana breed sheep with rams of the specialized meat breed Suffolk, in the first generation of half-breeds and the estimation of the quantitative parameters of meat production, under intensive fattening conditions.

Compared with the Turcana breed lambs, the half-breeds had improved characteristics, a higher fattening aptitude being obvious.

The results pointed out that the young half-breeds responded well to the intensive fattening system. The fattening parameters were: 198.5 g daily weight gain and 38,84 kg body weight feed consumption depending on age and weight.

These parameters prove that the young Suffolk-Turcana half-breeds have a very good fattening aptitude and this system should be practiced in the fattening farms. The importance of breeding sheep and goats consists both of the diversity of the obtained products (milk, meet, wool, skin) and the economic significance of this production, reflected in the increasing demand of milk as well as of milk and meet products.

There are several ways of increasing this production: improving the productive capacity of the local breeds, achieving an efficient selection and creating several selection nuclei, improving the breeding the production conditions, etc.

The sheep meet production in Romania increased due to the higher demand of some countries from the Middle East and even from the Western Europe. To increase the qualitative production of meet, it is necessary to resume the technology of intensive industrial fattening of the young sheep and rebuilding the young ram fattening complexes, as the demand is the highest for this category, which provides the highest economic efficiency.

A very efficient lever in increasing the meet production is the use of industrial crossing; good results were obtained in this respect using the remarkable combinative features of the local breeds with breeds specialized in meet production like Border – Leicester, Ile de France and mainly Suffolk.

#### **1. MATERIAL AND METHOD**

With a view to obtain pertinent data, the material representing the object of the research was divided into two lots: the experimental lot consisting of 25 Turcana - Suffolk half-breeds and the control lot consisting of 25 lambs of Turcana breed. The lots were set as homogenously as possible (table No. 1), both from the point of view of age and of weight, so that insignificant differences were recorded.

#### Animals' age and weight at the beginning of the experiment Table No. 1

Crt	Specification	Control lot			Experimental lot		
No.		n	X±sx	Cv%	n	X±sx	Cv%
1.	Alms age in the beginning of the experiment	25	62.3±15.8	25.36	25	64.5±10.5	16.27
2.	Initial weight	25	13.28±1.4	10.54	25	15.08±2.12	14.05

The young sheep were brought to the fattening complex at the age of about 2 months, having an average weight of 13.28-15.08 kg and they were individualized by ear tags and tattoos.

The intensive fattening technology with 120 days duration was used, of which:

• 15 days – the period of adjustment;

- 75 days the fattening period proper;
- 30 days the finishing period.

The animals were kept in common stalls; a density of 2.0 lambs/sq.m. and identical microclimate conditions were provided.

The fattened lambs were fed with a sole mixture of hill hey and combined fodder (consisting of corn, barley, sunflower grouts, zoofort, dicalcic phosphate and salt) whose structure and nutritive value (during the fattening period) are shown in Table No. 2.

Crt		Sole mixture structure (%)						
No.	Specification	Adjustment	Finishing					
		phase	phase	phase				
1	Fibrous	18	35	23				
2	Concentrates	74	60	72				
3	Zoofort and mineral fodder	8	5	5				
4	PBD/kg mixture	120.2	106.4	94.8				
5	UN/kg mixture	0.93	0.86	0.94				

#### Structure and nutritive value of the sole mixture Table No. 2

In order to determine the influence of the improving breed on the Turcana breed parameters (quantity and meet production), the following indicators were taken into account: the average daily weigh gain of every lot, the total weight gain for the whole period of time, the specific consumption and the efficiency at slaughtering of the two lots included in the experiment.

Periodic weighing was made for each lot, with a view to establish the fattening aptitudes and the specific consumptions of SU, UN and PBD/kg weight gain were determined by weighing the given quantities and the non-consumed remains.

#### 2. RESULTS AND DISCUSSIONS

Analyzing the results obtained following the processing of the data provided by this experiment (table No. 3), the following remarks were made:

Crt No.	Specification	Control lot			Experimental lot			
		n	X ± sx	Cv%	n	X ± sx	Cv%	
1	Average daily weight gain (g/head/day)	25	160.3 ± 18.5	11.54	25	198.5 ± 25.3**	12.74	
2	Total weight gain (kg/head/fattening period)	25	19.28 ± 2.4	12.44	25	23.76 ± 3.12**	13.13	
3	Final weight	25	32.56 ± 3.45	10.59	25	38.84 ± 4.52**	11.63	

#### Value of the quantitative parameters in the meet production

1. - the breeding intensity, reflected by the average daily weight gain, was higher for the experimental lot. The Suffolk×Turcana half-breeds had a 23.8% higher average daily weight gain, and significant distinct differences were noticed between the lots. The weight gain of the Turcana breed lambs was of about 160.3 g /head/day (which observes the performance requirements of the breed), proving their relatively good aptitudes for meet production;

2. - the total weight gain achieved during the fattening period follows the same trend, with significant distinct differences maintained between the lots. The Turcana breed had a total weight gain of only 19.28 kg, that is 18.85 % lower than the one achieved by the experimental lot;

3. - the final weight, a consequence of the different breeding pace, is over 19 % higher with the Suffolk×Turcana half-breeds. This weight difference obtained under the same conditions emphasizes the superiority of the paternal breed, materialized in precocity and superior breeding pace under intensive fattening conditions.

The capacity of food turning to good account (table No. 4) is very important in the activity of sheep breeding and fattening and it is an essential condition for the economic efficiency of this activity.

Crt	Specification	Control lot			Experimental lot		
No.		n	X ± sx	Cv%	n	X±sx	Cv%
1	Consumption of fibrous food	25	$2.91 \pm 0.25$	8.59	25	$2.29 \pm 0.36$	15.72
2	Consumption of concentrates	25	$4.72 \pm 0.84$	17.79	25	$3.98 \pm 0.62$	15.57
3	Consumption of SU	25	$6.06 \pm 1.05$	17.32	25	5.45 ± 1.25	22.93
4	Consumption of UN	25	6.86 ± 1.25	18.22	25	$5.51 \pm 1.22$	22.14
5	Consumption of PBD	25	$576.22 \pm 43.4$	7.53	25	$514.9 \pm 45.2$	8.77

#### Capacity of food turning to good account (kg/kg weight gain) Table No. 4

The shown data emphasize the Suffolk×Turcana half-breed's superior capacity of food turning to good account.

Thus, to increase the body weight by 1 kg, the Turcana breed lambs had a higher consumption at every indicator (27 % for fibrous food, 18.5 % for concentrates, 11.19 % for SU, 24.5 % for energy and about 12 % for proteins), which indicates a lower amelioration degree and a lower capacity of turning to good account the conditions offered by the intensive fattening system.

The slaughter house aptitudes of the animals included in the experiment (table No. 5) were presented by analyzing the slaughter weight, the carcass weight and the slaughter yield.

#### Slaughter house aptitudes Table No. 5

Crt	Specification	Control lot			Experimental lot			
No.	specification	n	X ± sx	Cv%	n	X ± sx	Cv%	
1	Average slaughter weight (kg)	25	32.56 ± 3.45	10.59	25	38.84 ± 4.52	11.63	
2	Average weight of warm carcasses (kg)	25	$16.33 \pm 1.65$	10.10	25	$20.08 \pm 2.48$	12.35	
3	Average weight of cold carcasses (kg)	25	$16.04 \pm 1.02$	6.21	25	19.70 ± 1.20	6.09	
4	Slaughter yield (%)	25	$50.16 \pm 4.12$	8.21	25	51.5 ± 5.20	10.09	

As far as the slaughter aptitudes are concerned, it can be noticed that the animals from the experimental lot had higher indicators than the Turcana breed. Thus, in case of the Suffolk×Turcana half-breeds, the average carcass weight is higher (over 22 %) both for warm and for cold carcasses, due to the higher weight accumulated during the fattening period.

The slaughter yield has close enough values (the difference is of about 2.6 % in favour of the experimental lot), which demonstrates that, under proper fattening conditions, the young Turcana breed sheep have a yield close to that of the specialized meet breeds.

#### **3. CONCLUSIONS**

3.1. - Following the carrying out of the experiment consisting of fattening the young rams from two lots (Turcana breed lams and Suffolk×Turcana half-breeds) a final weight of 32.56 kg was obtained for the control lot, and a final weight of 38.84 kg for the experimental lot, which demonstrates the genetic superiority of the half-breeds (due to the action of the parental breed) as far as the breeding energy was concerned.

3.2 - To obtain a live weight gain of 1 kg, the energy consumption was of 6.86 UN for the Turcana breed lambs and of 5.51 UN for the half-breeds, which emphasizes the precocity and the higher capacity of assimilation and of food conversion for the lambs included in the experimental lot.

3.3. - The slaughter aptitudes were better for the experimental lot, compared to the Turcana breed, which demonstrates the economic efficiency of fattening half-breeds with breeds specialized for meet production.

For a more efficient breeding of the Turcana breed sheep it is recommended to cross those with poor production with Suffolk rams and to intensively fatten the first generation half-breeds, due to the remarkable aptitudes for meet production.

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#### THE ALNALYSE OF POSSIBILITIES TO DEVELOP THE WINE SECTOR IN THE CONDITIONS TO ADHERE ROMANIA TO U.E.

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#### ABSTRACT ( Romania, between west and east )

During the next years, Romania will have to accomplish an extremely difficult task in the development of the wine-growing industry. Local wine producers have to handle, on one hand, with the pressure from the behalf of the European partners, that are forced to deal with bigger wine stocks in a substantial regressing sector, and on the other hand to cope with extremely powerful competitors from the Republic of Moldova. a state with a dynamic and strong motivated wine industry oriented to new market destinations.

In both cases, the stake is the same: to win the confidence of the Romanian consumers. And this by hook or by crook, even if crushing any conduct rules existing on a market and accepted tacitly or explicitly.

**Key words:** european wine market, romanian wine import, romanian wine export, wine market instability.

#### INTRODUCTION ( The EU is switching the points )

Recently, the "European Agriculture Commission and Rural Development" advanced a specialty report; on it s base the so-called "D.G. Agri C3" was emitted, where they have drawn an ample analyses of the European wine-making industry. The data presented in the report have been advanced for discussion to the European Parliament and presented partially to the Romanian public on the site of the Vine and Wine National Employers (www.pnvv.ro).

The report notices, even from the beginning, the fact that the priorities of the wine industry' politics have changed constantly in time. If try the '60 as priorities were considered the wine related products alimentary safety, the productivity and stability of the market, than in the 1980 under the pressure of a major' crises In this industry, the priorities changed into the decrease of the overproduction and the sector expenses. In 1992 prior became the cut in the wine surplus, environment's protection and the income stability of the viticulture enterprises. It is important to mention that in 2000 the situation changed to some reforms in this industry, the stimulation of the competitiveness and rural development, in comparison with 2005-2006, when the industry was oriented to new markets, an income growth of the viticulture enterprises, once again rural development and environment's protection. The report insists to continue following this priority for future as well.

#### The decrease of wine consumption

It's interesting to analyze also the wine conduction at the European level. Between the years 1984-1990 it was approximately 140.000,000 hl (the report based on the data of 15 central and west European countries), it decreased constantly in 2003 to 120.000.000 hl, the same tendency being captained in 2005-2006.

Concerning wine type, we observe a slight preference of the European consumers for wines of superior quality, its account raising constantly during the period 1984-2002, coming very close in 2003 (with 60.000.000 hl or 50% weight) to the conduction of the table wines, the same trend of growing being preserved, also in 2005-2006. This situation strengthens the position of the topnotch wine enterprises, of the authentic products and of the universally accepted wine regions.

#### An alarming growth of the outside European community imports

The report also analyses the economical "engine" of the viticulture sector, respectively the balance between the communities export-import. In 1993 the communities export of the 15 state-members was on the level of 11.000.000 hl yearly, that raised to 15.000.000 hl in 2005, a growth of 36.63% (3,03% annually), the tendency being still actual.

Concerning the balance of the imports the situation is quite alarming. In 1993 the communities import level was of 2.300.000 hl yearly, exploding in the last period about 10.000.000 hl in 2005, that represents a growth of 335% (27,91% yearly). This fact words not only the producers but also the European authorities, basing on the negative effects of the overproduction crises of the wine industry in the '80.

#### The output and the stocks - at the same level

A second reason for Europeans to worry is the so-called "approach" between the output and the stocks. Till 2000 existed a sufficient disparity between wares output and the stocks, that reduced considerately up to zero

starting with 2002. The income of the wine-growing enterprises/farmers is falling. The cherry on the cake represents a constant income fall of the wine-growing enterprises, starting with 1999, that is still strongly felt by small producers and farmers.

All this data presented and motivated in the European report lead us to a certain conclusion that is the necessity of a sector reform. In this context a better orientation to the east-European market, including Romania and Bulgaria, would represent a fresh breath for the traditional European producers, whose income is falling. The report indicates, also the following priorities for building a lasting development of the wine industry sector: an economical viability, a social acceptability and environment protection.



The challenges of the wine market Consumption, according to the wine type (EU-15)

As main objectives of the reform are mentioned: an improvement of the European producer's competitiveness, the recognition of the quality wines reputation, certain rules, simple and efficient to ensure the balance between request and the offer, a consolidation of the social layer in the rural zone, environment protection etc.

The following measures are recommended:

- an output cut and the processing institutions limit;

- limiting the zones for special protected varieties;

- the land clearing of 400.00 ha of grafted plantations in the following 5 years, with a support of 2.40 billion euro's;

- originating some national financial support for the sector's development.

A hardening of the environment protection (mostly fighting against the soil erosion and decontamination of the fertile layer, the use of agro-biological produce for crop improvement, a good management of the offal's); a modernization of the output structure; an elimination of the non-effective measures like: distilling the sub- products, the drinkable alcohol and of the wine from grapes with a joint function a public stocking of the alcohol, a support for private stocking(wine and must), support for the use of the must etc.; avoiding sugar and using only +2% and +1% C zone concentrated must; retrenchment of the must import prohibition for winemaking; retrenchment of "couppage" wines from UE with import wines; winning the access to the traditional markets through clear, simile and transparent rules; one-way labeling(the same compulsory and optional mentions for all types of finest; security for the local savings and a growth of the social protection through encouraging the young farmers, early retinal, marketing investments, and a new orientation to other agricultural activities.



#### Imports and exports in volumes

#### **Back clouds on Europe Sky**

The conclusions of this report would better be drown by us, but deserves to mention the fact that the situation is not pink at all, and only becoming a member of European Union will not vanish the differences between us. Doubtless, the world's wine market is strong competitive, the lack of new sale markets, the decrease of the internal consumption and the storm of the imported wine, make the "game" on the European market very dangerous. For these reasons the European report trays to identify some possible solutions, trying to make a coherent strategy in due time.

It is obvious that the European tendency is to limit the wine outcome and even the shrinkage of the surfaces, with all the economical collateral consequences that result into: unemployment, professional twitchy economical bankruptcy for small communities etc. Under the pressure of the already existing stocks, to find new sale markets equalizes for the European wine producer with the invasion of "the east" that anyway doesn't face the quality standards.

#### **Republic of Moldova - a bitter competitor**

Viticulture in Republic of Moldova represents a real danger for Romania. Having a dynamic and developed wine sector that capitalizes its traditions and modern technology to create a good image on the Romanian market. Although the presence of the Moldavian wines on our market gets stronger, a lot of wine makers don't consider the import of the Moldavian wines a danger for Romania.

For example Mr. Claudiu Necsulescu (major joint stocker of SC Jidvei SA and the manager of the outcome Council April-October 2006) asserts with the occasion of the folklore festivals: "I'm not afraid of the Moldavian competitors, as it is still not a member of UE and we can tom off the tap, reducing the import either through prohibitive custom charges, or through introduction of the compulsory maximal limit".

In my opinion, those who treat the "problem" of the Moldavian wines artificially fail to see the following things:

- Moldova can not compete with other neighbors countries (Bulgaria and Hungary), that represent a genuine wine force;

- Let's not forget the in the period 1997-2002 Republic of Moldova exceeded USA in the top world wine exporters.

With an account of 1,6 billion hl of wine per year Moldova set on the 6 place, while USA was on the 7th place with 1,1 billion hl per year. ("L'Encyclopedie Mondial du Vin" - Paris, France). In the last 4 years Moldova registered a regress in wine export due to the Russian "reticence", but also reorienting to other markets. Accepting that, it is still an important player on the

world's wine market with a great potential. Although the European consumer prefers more dry and red wines, the Romanian one rather goes for sweet wines.

For sweet white wines we have a good variety of valuable wines (Tamaioasa romaneasca, Muscat Ottonel etc), for sweet red wines the Romanian market doesn't have any alternatives.

Being aware of this fact the Moldavian companies try to penetrate the Romanian market orienting on this special segment. Gaining prestige on the market, the consumer will hardly give up the preferable wine, even if it will get more expensive due to the custom charges. Those that believe in the possibility of an easy implementation of the prohibition custom charges I remind about the bilateral agreements signed by Romania, hardly breakable without creating some tensions or even diplomatic incidents.

#### Romania, crushed by its own impotencies

The first analogies of the wine Romanian sector, as part of the European one, there are a lot of things to worry. Romania is the European country with the biggest amount of plantations with hybrids directly producer (about 125.000 ha), in the conditions, when the majority of the European states (France, Italy, Germany etc.) totally destroyed them in the '80. The numbers of the last year evidence show a turning back in time of the wine-making sector. Our magazine "pointed out the emergency signal".

![](_page_50_Figure_6.jpeg)

#### The Market's instability

In the previous issues, publishing a series of materials dedicated to the so called explosion of the plantations with direct hybrids from the variety of the inter-war time, weak in productivity and inferior quality. A simple calculation shows that we need 149 billion Euro yearly to close the difference of the grafted

plantations (2006 - 120.000 ha) in comparison with those with direct hybrids, at a price estimated at 10.000 euro/ha. These expenses don't include the replant of the already existing noble wine plantations that will get till 2014 the physiological decline (aging). To this financial effort we can add approximately 190 billion Euro (19 billion/yearly), the expenses for replant, hybrid production or abandonment bonus. All these things should be pointed out through political debates in order to assure in time alternative financial sources.

#### **CONCLUSION** (Where from to wait the rescue?)

Romania and Bulgaria entered the European Community in a quite difficult period for viticulture, and it will be hard to survive with the already existing problems, when trying to fit the European rules. With the winemaking patrimony halved by the existence of direct hybrid wine plantations, Romania is a victim of already deficient Europe, also if taking in consideration that it doesn't

have any national coherent strategy of reforming this sector and mainly without a coagulation of all representative forces as well as the governors.

Whether we want to recognize or not, Romanian viticulture stepped to another decisive level for its development on 01 January 2007. Many of us try to minimalist the effects of what will follow postponing the implementation of the European standards, hoping it will go any way. There is no essential control of the quality of the wine-vineyard production, the inner market being invaded by wines with doubtfully quality. The authorities wail bringing as arguments the lack of up-to-date equipment and analogies laboratories; and it is indeed quite a chance to find genuine Pinot noir in a Romanian bottle with a label of Pinot noir.

The situation is more servos in case of the traditional Romanian wines that have to face the West. The types "Busuioaca" and why not "Tamaioasa" are the most doctor wines. In spite of the absence of up-to-date equipment, the evidence is unquestionable. It's impossible to produce on a surface of some 10 till 100 ha an account of wine to supply every district' pub.

Also there is no real preoccupation from the side of the Romanian producers to honest - minded competition. Romania is the only European country that doesn't have a national wine contest with international jury professional selections made on quality not on certain interests.

In this condition, a lot of foreign firms that invested already in the winemaking Romanian sector prefer to compete abroad that to get compromised at our local gestations. We have to understand once and for good that in order to keep on objectiveness you cannot be the judge and the player (to read merchant) as happens in Romania.

![](_page_52_Picture_0.jpeg)

All these things only estrange us from the communities' wealth, in the conditions when the Italians, French, Spanish, Greek and Moldavian wines just waft to enter our market. If we'll continue to present ourselves as irreparable victims before the invasion of the foreign wines, we will get more far from the local consumer. The conclusion would be to under-stand earlier or later, that quality and not the origin of the wine is important for the local or foreign beneficiary.

![](_page_52_Figure_2.jpeg)

![](_page_52_Figure_3.jpeg)

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Rector, prof. univ. dr. Floarea NICOLAE

![](_page_55_Picture_4.jpeg)