THE VALUATION OF NORTH EASTERN VINEYARDS FROM ROMANIA FOR IMPLEMENTATION OF SUSTAINABLE VITICULTURE

EVALUAREA PODGORIILOR DIN NORD ESTUL ROMÂNIEI PENTRU IMPLEMENTAREA VITICULTURII DURABILE

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Abstract. *The vine growing area in the North-East of Romania is one of the most important one, as it comprises the areas of some old vine estates with a long tradition in grape growing, such as the vine estates of Cotnari, Huşi and Iaşi. The particularities of the area are determined by both, the restrictive effect of some weather factors (minimal temperatures under the vine resistance limit, long lasting droughts in summer), limited ecologic plasticity of some sorts (Grasa de Cotnari, Zghihara de Huşi, Busuioaca de Bohotin, Fetească Neagră de Uricani), on the one hand, and the soil types that we find in that area, from excessively calcareous soils in the Cotnari vine estate, up to the forest gray soils in the Avereşti-Huşi area, on the other hand. Therefore, the restructuring of classical technologies for vine growing practiced in the area, according to the requirements of sustainable viticulture, impose the solution of some interdisciplinary aspects (agrometeorology, ampelography, agrochemistry, viticulture, phytosanitary protection, management and agricultural marketing) and the choice of optimal variants, that may continue to ensure the well known quality of vine products in this area*

Key words: vineyard, sustainable viticulture**,** vine, weather factors, technologies for growing

Rezumat. *Zona viticolă de NE a ţării este una din cele mai importante, cuprinzând arealul unor podgorii vechi, cu o îndelungată tradiţie în cultura viţei de vie, aşa cum sunt podgoriile Cotnari, Huşi şi Iaşi. Particularităţile acestui areal sunt date atât de efectul restrictiv al unor factor climatici (minime ale temperaturii sub limita de rezistenţă a viţei de vie, seceta îndelungată pe timpul verii), soiurile cultivate, multe din ele cu plasticitate ecologică limitată (Grasa de Cotnari, Zghihară de Huşi, Busuioacă de Bohotin, Fetească neagră de Uricani) cât si de tipurile de sol întalnite în această zonă, mergând de la cele cu exces de calcar în sol din podgoria Cotnari, până la cele cenuşii de pădure din zona Avereşti-Huşi. Prin urmare, restructurarea tehnologiilor clasice de cultura ale viţei de vie, practicate în această zonă, la cerinţele viticulturii durabile, impune rezolvarea unor aspecte interdisciplinare (agrometeorologie, ampelografie, viticultura, agrochimie, protecţie fitosanitară, management si marketing agricol) şi alegea variantelor optime, care să asigure iîn continuare calitatea binecunoscută a produselor viticole din acest areal.*

Cuvinte cheie: podgorie, viticultură durabilă, viţă de vie, factori climatici, tehnologii de cultură

In its large sense, the meaning of sustainable development as "*the capacity to meet the needs of the present generation without affecting the capacity of future generations to meet their own needs*", economic prosperity and environment conservation must support one each other. In the conditions of Romania, sustainable development means management and conservation of basic natural resources: conservation of land, water, biodiversity, environment and orientation of technological and institutional exchanges in such a way that they might meet human needs for both present and future generations.

Sustainable development retained the attention of specialists since the report of the World Commission for Environment and Development "Our Common Future" appeared in 1972. Such concept was developed and integrated in economic-social development strategies. In the Conference of Rio de Janeiro, in June 1992, it was stated the fact that environment and economic development are compatible, as they have complementary purposes. By adopting the Agenda 21 as consequence of the international agreement expressed in the Declaration of Rio de Janeiro, sustainable development became a global strategic option of action.

The accession of Romania to the European Union implies deep and important changes in the Romanian villages. Agriculture according to European standards imposes the modernization of the legislative and institutional system and of the production system, as well as the adaptation of the entire concepts of production, processing and merchandising of agricultural products according to standards applicable in the European Union. The focusing of this subject is a need imposed by the necessity to find ways for the progress in agriculture and, implicitly, for the progress of the Romanian village.

Sustainable horticulture in the conditions imposed by EU requirements can be assimilated in a high proportion in Romania as well, in case that the legislative conditions, the institutional framework and the certification and marketing procedures for agricultural alimentary products are adapted in such a way that they will allow the conversion of large surfaces to sustainable production.

MATERIAL AND METHOD

In the three main vine estates of the North-Eastern area of Romania, Iaşi, Cotnari and Huşi, there will be collected climactic data in order to perform physic-chemical and climatic analysis. There will be calculated synthetic ecologic indexes and, on the bases of the obtained results and of the interpretation of analytical data, there will be established which are the ecoclimatic limitative factors for the vine and which are the possibilities to improve them in order to promote a sustainable viticulture.

Within the vine growing ecological stations that University of Agricultural Sciences and Veterinary Medicine of Iaşi has for the discipline of viticulture and

on the bases of the collaboration with prestigious vine growing institutions in the are (S.C. Vinia, S.C. Cotnari, S.C. Vincon – workplace in Huşi), the proposed subject will be performed at the Iaşi, Cotnari and Huşi vine estates. In order to fulfill this objective, the following activities will be performed:

- Evaluation of weather conditions in the reference vine estates in the North-East of Romania;
- Establishing the ecoclimatic limitative factors for the North-Eastern area of Romania and their improvement possibilities.

RESULTS AND DISCUSSIONS

The sustainable viticulture as it is defined in the resolutions OIV CST 1/2004 represents: the development of a unitary concept regarding the systems of grape production and processing in harmony with the economic and structural perennation of the wine growing terroir and of the quality and safety of the products obtained in the context of a safe viticulture, which will take into account the risks related to the environment and to consumers safety and will have to emphasize aspects related to patrimony, history, culture, ecology and landscape of the vine growing area.

For the restyling and optimization of vine growing technologies in the NE area of Romania, according to the requirements of sustainable viticulture is necessary the reevaluation and efficiency in the usage of natural resources, as well as in the production in the wine growing ecosystem, in conditions of sustainable production in the grape plantations in the NE of Romania. For this will lead to applying with success the specific technological chain in an appropriate volume, considered as the base for sustainable viticulture production and at the same time, they may contribute substantially to the protection of the soil and of other environment resources against degradation as well as to important growth in Romania.

The global heating caused a disturbance in the evolution of natural factors of the vineyard ecosystem: summers became extremely dry, autumns became either colder or wetter, either much warmer than usual, while winters are shorter and with extreme low temperatures. It became very usual to record frequent alternations of dry spells with excessive wet periods. The consequences for vineyards are as follows: because of the prolonged active period of vegetation, the vines enter unprepared and not matured enough in winter. The atypical autumn climatic conditions lead to a defective maturation of the grapes which, therefore have small quantities of natural components, responsible for wine quality. This study followed the evolution of the climatic factors in the vineyards in Moldavia, over a period of 10 years.

In the wine-growing zone of of Romania, located between the geographical coordinates of 46°31' - 47°35' northern latitude and 27°28' - 27°36' longitude is one followed the evolution of the climatic factors in the vineyards located in the septentrional zone of of Moldavie, namely, Iaşi, Cotnari and Huşi,

and for the comparison, one retained the values of the climatic factors of last the ten years period, and that in order to surprise the states which limits for the sustainable viticulture in this wine ecosystems (tab.1).

Table 1

Values of the bioclimatic indices in the NE wine-growing zone of of Romania followed during one 10 years time and the limits for sustainable viticulture

Bioclimatic indices	Limits	Iasi	Cotnari	Husi
Annual average temperature (^{0}C)	≥ 9,0	9,8	9,3	10,5
Average of the monthly minimas in the air (^{0}C)	-24 ... -22	-23,8	-24,1	-23,9
Average of the monthly maximas in the air (^{0}C)	≤ 42	36,2	35,9	36,8
Total heat balance (^{0}C)	≥ 3200	3893,8	3685	3884
Active heat balance (^{0}C)	≥ 2600	3335,9	3216	3275
Useful heat balance (^{0}C)	≥ 1000	1446,5	1376	1455
Real insolation in the per. of vegetation (no. hours)	≥ 1200	1529,6	1489,5	1513,1
Total annual precipitations (mm)	500-700	498,6	510,2	501,9
Total precipitations in the per. of vegetation (mm)	250-500	301,9	332,1	309,5
Relative humidity of the air (%)	50-80	68	70	66
Length of the growing period (no. days)	≥ 160	187	184	186
Real solar index	≥ 1,30	2,21	2,05	2,20
Hydrothermal coefficient	0,7-1,8	0,91	1,03	0,98
Wine bioclimatic index	≥ 4,0	9,03	7,84	8,60
Index of the oenoclimatic aptitude	≥ 3600	4813,6	4623,4	4728,6
Index of Huglin	≥ 1500	1953	1891	1959

By applying the sustainable viticulture in NE area of Romania it is possible to obtain a series of results with immediate and long-term effects in the sector of vine growing. As economic effects we should mention: the obtaining of some technologies, specific for sustainable viticulture in the North-East of Romania, which will be applied in other facilities that wish to implement them; the optimizing of production technologies for table and wine grapes, as well as the quality improvement of the obtained products, the alignment of production and merchandising technologies according to standards imposed by the EU; and the modification of vine growing practices with benefic results for the incomes, which is a contribution for the regional and rural development.

The social impact of the practice sustainable viticulture is represented by: the increase of alimentary safety; the growth of possibilities of professional formation for vine producers; the increase of

performances and the competitiveness of vine producers (implicitly the improvement of the market position); the development of knowledge and skills and the increase of technical competences; the development of consulting in the field; the increase of the conscious awakening of producers regarding problems related to alimentary safety and quality control in the vine growing sector; the ensuring of welfare for vine growing workers and for the vine growing ecosystem, as requirements imposed by European life standards.

The impact on the environment is highlighted by: the contributions to protection and increase of environment quality through the responsible administrations of vine growing; the improvement of decisions regarding the rational use of manure and pesticides, in order to reduce the risk of soil pollution and phreatic water; the reduction of environment pollution by means of an appropriate management of soil, fertilizers, irrigations and wastes that result from the technological process, according to the norms of "Good Agricultural Practices (GAP)".

CONCLUSIONS

The natural setting in the North-Eastern viticultural centre of Romania has a markedly continental climate, with relative harsh winters and droughty summers, influenced by the air circulation in the open valley of the Prut river. For practise a sustainable viticulture the ecoclimatic conditions is limitative.

In the present case there will be comparatively analyzed the classical vine growing technologies with the requirements of sustainable viticulture and we shall proceed to perform, apply and monitor new vine growing technologies in the North-Eastern area of Moldavia, together with the identification of the critical points that appeared in these technologies and, especially, of the corrective actions imposed by their appearance.

During the identification of risks, evaluation, further operations, sketching and applications of the HACCP systems, we should give special attention to the impact of certain technological elements (the choice of land, the creation of cultures, maintenance and harvest works) and, especially, of those sequences that refer to: harvesting, sorting, conditioning, packing, conservation and transport of the harvest.

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