

Eugeniu, Alexandrov; Vasile, Botnari; Boris, Gaina

Conference Paper

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Provided in Cooperation with:

The Research Institute for Agriculture Economy and Rural Development (ICEADR), Bucharest

Suggested Citation: Eugeniu, Alexandrov; Vasile, Botnari; Boris, Gaina (2021) : The development of viticulture through the prism of the green economy requirement, In: Agrarian Economy and Rural Development - Realities and Perspectives for Romania. International Symposium. 12th Edition, The Research Institute for Agricultural Economy and Rural Development (ICEADR), Bucharest, pp. 74-76

This Version is available at:

<https://hdl.handle.net/10419/263023>

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THE DEVELOPMENT OF VITICULTURE THROUGH THE PRISM OF THE GREEN ECONOMY REQUIREMENTS

ALEXANDROV EUGENIU¹, BOTNARI VASILE², GAINA BORIS³

Abstract

*The primary imperative of the sustainable development of the wine sector is to obtain high production, with low consumption of resources, in conditions of increased economic efficiency and the use of technological links that contribute to reducing energy consumption. High quality wine derivatives can be provided, taking into account three main factors: genotype (variety), location of the plantation (soil and climatic conditions) and applied technology (cultivation and processing). Intraspecific genotypes have a wide capacity for use, but at the same time do not ensure overcoming the barrier of climate change. That is why, taking into account the functionality of genotypes and the use of technical algorithms and interspecific hybridization methods, more plastic rhizogenic interspecific genotypes should be created in terms of their adaptation to climate change, with beneficial repercussions on the sustainable development of the wine sector. As a result of the crossover of *V. vinifera* L. with *M. rotundifolia* Michx. interspecific vine genotypes have been obtained and identified that allow the expansion in the northern area of the vine cultivation area on its own roots, while reducing the number of chemical treatments, which will contribute to obtaining products ecological and environmental protection. Rhizogenic interspecific genotypes possess an early period of grape maturation can be multiplied by pruning, without grafting, thus obtaining rhizogenic propagating material that contributes to reducing the costs of setting up vineyards. They were approved as table grape varieties: "Malena", "Nistreana" and "Algumax" and grape varieties for fresh consumption and processing: "Augustina", "Alexandrina" and "Amethyst". By creating plantations, it will contribute to the extension of the area to the northern limit of vine cultivation.*

Keywords: area, genotype, green economy, viticulture.

JEL classification: Q01, Q57

INTRODUCTION

The principles of the economic development of the society, in the past focused on the inefficient and irrational use and capitalization of natural resources with an irreversible impact on the environment. The process of socio-human development did not take into account the amount of natural resources and the state of the environment. Therefore, the biggest challenge for society is to integrate environmental sustainability into the context of economic development. The development of society through the prism of the green economy means the restoration and maintenance of a sustainable, long-term balance between economic development and the integrity of the natural environment, in forms understood and accepted by society. The problems of environmental protection and economic development need to be solved in a correlated way, for the good of the whole contemporary society and of the future generations. The transition to a green economy will create major economic opportunities, finally stimulating the implementation of innovative technologies with minimal risk to the environment (Environmental Strategy for 2014-2023 and Action Plan for its implementation, 2014). The basic fields of agricultural development, such as viticulture, fruit growing, etc., require the use of human, financial, natural resources with a major risk on the environment. Based on the principles of the green economy, it is necessary to create plant genotypes that have an increased energy utilization coefficient (direct, indirect and passive assets), being accompanied by cultivation technologies with minimal impact on the environment. One criterion by which the performance of an agricultural ecosystem can be determined is the economic-energy efficiency. As a result of the cultivation technology, a certain amount of energy is consumed, which is expressed by: labor, fuel, fertilizers, fungicides, herbicides, insecticides, financial means, etc. as well as the solar energy necessary for photosynthetic activity, which is ultimately transformed into biochemical energy expressed through crop harvesting (Dejeu et al., 1991). The calculation of the

¹* Institute of Genetics, Physiology and Plant Protection, e-mail: e_alexandrov@mail.ru

²Institute of Genetics, Physiology and Plant Protection, e-mail: vasilebotnari@yahoo.com

³Academy of Sciences of Moldova, e-mail: borisgaina17@gmail.com

energy coefficient allows the determination of the most efficient plant genotypes, thus reducing the energy consumption and increasing the energy-economic value of the derived products obtained. In order to ensure a stable and quality harvest in conditions of increased economic and energy efficiency, it is necessary to take into account the technological stages of cultivation, as they require considerable human and economic resources, they are used in the production of seedlings, plantations, plant protection, irrigation, tillage, etc.

MATERIAL AND METHOD

The interspecific rhizogenic vine genotypes with table grapes: "*Malena*", "*Nistreana*" and "*Algumax*", as well as with grapes for fresh consumption and processing: "*Augustina*", "*Alexandrina*" and "*Amethyst*" (Alexandrov et al., 2020; Catalog of plant varieties of the Republic of Moldova, 2020). The respective genotypes are planted in the experimental vine sector of the institute. The management technique (formation / modeling) of the plants determines the habitus of the hub, in that case the unilateral horizontal cord system was used, bilateral single-storey, with one or two stems and the height of 80 cm, with the vertical management of the shoots. Planting scheme: between rows - 3.0 m, and in a row, from plant to plant - 1.5 m. Type of support - vertical trellis with upright shoots (vertical), height of the support (pillar) - 2, 0 m with three levels of conduction (first level - one wire, the second and third level - two parallel wires, at a distance corresponding to the thickness of the pole) (Alexandrov et al., 2020; Dobrei et al., 2011).

RESULTS AND DISCUSSION

Based on the results of the monitoring of environmental factors, it was found that climate change is gaining momentum globally. The generator of these changes was and is the technical-economic progress of the society, taking into account the principles of sustainable development. It is necessary to promote a green economy policy by motivating, stimulating through various aspects (economic and financial, technologies, products, etc.) those who as a result of economic activity cause an impact on the environment. The involvement of economic agents is required in order to carry out a sustainable activity, both from an economic point of view and the impact on the environment and be minimal. Otherwise, without promoting these policies, the expected results will be minimal and the state of natural resources and the environment will continue to deteriorate.

In the process of creating new vine genotypes, it is necessary to pay special attention to the functional-technological features, such as: - cultivation technology; - performance / productivity (in relation to the vegetation period and the pedoclimatic area); - the balance between growth and fruiting; - phytoanatomobiochemical and physiological character; - resistance to diseases and pests; - the relevance of resistance to low temperatures; - ripening of grapes; - chemical composition of berry juice and derived products; - the attractive appearance of the grapes; - crunchiness and consistency of the leg; - aroma and taste; - resistance to cracking of the bacilli; - transport and storage capacity; - the direction of use of the grapes; - recovery of waste as a result of grape processing. Based on the functionality of the genotype, in the future it will be ensured the existence of balanced, sustainable and diversified agroecosystems, which will guarantee the rational use of natural resources and a beneficial environment for the development of society (Alexandrov E., 2020).

The cultivation of vines, in accordance with the principles of sustainable development, includes on the one hand the reduction of costs for the procurement and use of chemicals needed to control diseases and pests, and on the other hand the minimization of the negative impact on the environment. The derived products obtained are of a high quality.

Climate change requires the creation of plant varieties that ensure performance under different production conditions. The current requirements of the wine sector impose the need to create new varieties with stable productivity potential, high quality of grapes and wine products. As a result of crossing the genotypes of *V. vinifera* L. ($2n = 38$) x *M. rotundifolia* Michx. ($2n = 40$) were obtained

and approved interspecific rhizogenic vine genotypes with table grapes: "*Malena*", "*Nistoreană*" and "*Algumax*" and with grapes for fresh consumption and processing: "*Augustina*", "*Alexandrina*", "*Sarmis*", and "*Amethyst*", which allow the expansion of the northern area of cultivation of vines on their own roots and reduce the number of chemical treatments, which will contribute to obtaining organic products and protecting the environment. .

These genotypes can be multiplied by the pruning method. The obtained plants are rhizogenic and allow the exclusion of some practical stages from the technological process, which contributes to the reduction of financial resources for the production of propagating material and the cultivation of vines. Grafting is a rather complex, risky and expensive technological process that requires special technical and practical knowledge, which consists in obtaining the plant by joining two different plant segments both genetically and morphoanatomophysiologicaly. This is nothing more than a symbiosis of the two partners (Dobrei et al., 2011).

Rhizogenic vine plants have a longer service life compared to plants obtained through the grafting process. As a result of the technology of obtaining the rhizogenic vine planting material, the stages related to the preparation of the ropes for grafting (grafting and rootstock), storage, grafting, stratification, rooting can be omitted.

The procedure for founding the vineyard is a complex process of research and analysis, aesthetic and technical creation, planning and technical-economic calculation, implementation and maintenance. In essence, real premises are created for the implementation of new varieties with increased resistance to biotic and abiotic factors of the environment, and based on new cultivation technologies are made the high demands of the green agro-industrial economy. Currently, wine products with increased hygiene, "bio", ecological, bidonamic can be really obtained and marketed successfully only by developing viticulture with new, interspecific, rhizogenic varieties.

CONCLUSIONS

1. The implementation of rhizogenic interspecific vine genotypes will contribute to the creation of biological vineyards.
2. Currently, the production of "organic" wine products and their marketing is possible only on the basis of the cultivation of new interspecific rhizogenic varieties, which have high resistance to diseases, pests, critical temperature fluctuations.
3. The green wine economy with its agrobiological stability, allows to increase the economic efficiency and guarantees an increased hygienic degree of grapes, juices, concentrates, wines of different types and distillates.

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