

Bioengineering 2021, 00001 (2021)
Greeting to the conference participants
Academician of the Russian Academy of Sciences Evgeniy Egorov
Chairman of the Conference Program Committee

Dear colleagues and participants!

I am pleased to welcome colleagues and participants of the International Scientific Conference "Biologization of the intensification processes in horticulture and viticulture", which will be held in Krasnodar, Russia, from September 21 to 23, 2021. The conference is organized by the North Caucasian Federal Scientific Center of Horticulture, Viticulture, Wine-making.

The conference will be devoted to the development and application of modern methods of biologization of the intensification processes in horticulture, viticulture, winemaking. The main purpose of the Conference is to discuss new priority scientific areas related to solving scientific and practical problems in the areas of increasing the stability of agroecosystems, managing genetic resources, the widespread use of molecular genetics methods in breeding, the production of planting material of the highest quality categories, plant and yield protection, agricultural soil science, personalized nutrition.

Modern technologies of cultivation of fruit crops and grapes, which exceed the previous analogues in measure of efficiency, are based on intensification – a set of ways to increase the technological and economic efficiency of production processes.

The world's socio-economic formations are developing within the framework of technological structures characterized by a qualitatively homogeneous composition of improved means of production and the use of fundamentally new ways and methods of transforming objects of labor.

The predicted technological shifts in horticulture and viticulture in the near future should include, in particular, a systematic increase in the resistance of cultivated plants to external stress factors and management of the productive potential of agrocenoses based on modern methods, including: biologization of production processes and resource conservation, including reducing the cost of living labor.

The characteristic features of the strategic appearance of promising technologies in fruit growing and viticulture, which determine scientific and practical tasks, should also include the dominance of digital technologies based on long-term empirical databases and modern methods of biologization.

When formulating a set of criteria for promising technologies, we should focus on the fact that the most relevant in solving problems will be the ecologization, biologization and resource saving of all technological processes, naturally, by new methods and ways: bioinformatics; biotechnologies based on molecular biology and biochemistry, genetic engineering; nanotechnologies, cellular technologies; artificial intelligence technologies.

The application of intensive technologies for the cultivation of fruit crops and grapes has ensured a more efficient use of biological and economic resources.

For example, intensive technologies for cultivating apple crops on super-dwarf rootstock (SK3) exceed the technology for cultivating crops on medium-sized rootstocks (MM106) in measure of efficiency, in particular: the potential productivity and optimal yield capacity of plantings exceeds the analog by 70 %, entry into commercial fruiting begins on the 2nd-3rd year instead of the 5th year, the number of plants placed on 1 ha is 6 times more.

The transition of fruit growing to a new technological way – a significant change in the structural elements of agrocenoses, associated with the intensification of processes, causes both positive and negative aspects of reproduction.

Against the background of changing manifestations of abiotic and biotic factors, the most significant negative manifestations of technogenic intensification should include bioresource deformations – disruption dispersion of the rationality of environmental management in agrocenoses and the stability of agroecosystems.

To the greatest extent, technogenic impacts cause deformations in the main elements of agroecocenosis – biocenosis, soil and soil microbiota, pathocenosis, which is manifested in pronounced destructive processes – a decrease in soil fertility and biogenesity, a loss of the stability of microbio-, acaro - and entomosystems, the immune status of cultivated crops, the inability of plants to realize their productive potential.

All this makes it necessary to adjust the functional orientation of the intensification methods mainly by biotechnological methods.

The most important advantage of biologization is a significant expansion of the number and range of biological mechanisms, structures and processes used to improve the production and environment-improving functions of agroecosystems and agricultural landscapes.

Biologization implies a qualitatively new approach to the mobilization of plant resources (their conservation, collection and use), as the main factor that takes into account not only the evolutionary dynamism of the genotypic composition of the gene pool, but also the biosphere role of agricultural landscapes.

Fundamentally new opportunities for the biologization of crop production are opened on the basis of the use of ecological and genetic regularities, the essence of which is that the indicators of the size and quality of the yield depend on different genetic determinants.

Biologization makes it possible to reduce the dependence of agroecosystems on unregulated environmental factors, improve the quality of agricultural products, and reduce the cost of anthropogenic energy for its production.

Biologization should be considered as the main factor of expanded reproduction of soil fertility, and it is used not as an additional, but as the main method, that is, the main component of technology, systems of agriculture, horticulture and viticulture.

The biotic components of the soil in the general system of biogeocenosis are characterized by greater stability, which once again emphasizes the paramount importance of soil fertility – the most important factor of biocenotic self-regulation of agroecosystems and agricultural landscapes.

Biologization should be considered as the "main expression of ecologization" based on the use of living organisms, their systems, and products of their vital activity in solving technological problems.

The conference will provide an ideal platform for the exchange of information on scientific developments with an emphasis on priority areas of research in the field of biologization of intensification processes.

We will be glad to welcome you on the Kuban land. This conference will give you valuable intellectual experience, as well as familiarization with modern developments introduced into the practice of agricultural organizations in Kuban.

Sincerely yours,

Chairman, Academician of the Russian Academy of Sciences Evgeniy Egorov